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Rocks and Minerals

Official Journal of the Rocks and Minerals Association

A Magazine for Mineralogists, Geologists and Collectors

August, 1947

35c

Vol. 22, No. 8

Whole No. 193

MORE FINE MINERALS. 15th LIST.

AZURITE from several localities: Tsumeb, S. W. Africa—superb loose xl. 1½ x 1¼ **$8.00**; group of ½" xls. on rock 2 x 1½ **$5.00**; museum specimen 4½ x 3½ group of large xls. some altered to Malachite **$20.00.** From the historic locality of Chessy, France — group of large xls. 2½ x 2 x 2 no gangue **$7.50**; another partly altered to Malachite 2½ x 2 **$3.50.** From Bisbee, Arizona—brilliant xls. w. Psilomelane on rock 3 x 3 **$5.00**; good xls. on matrix 4½ x 2¼ **$8.00**; minutely xld. and pisolitic 4 x 2¼ **$4.00**; another similar 4 x 2½ **$3.00**; sawn and polished half of xld. "ball" 2¾ x 2½ x 1¼ **$5.00.**

CASSITERITE, Schlaggenwald. Small group of fine twin xls. 1¼ ..... $ 3.00
Another group extremely fine 1¼". 5.00

CALCITE enclosing COPPER, Michigan. Small rhombohedral xls. on rock. 3 x 3 ..... 3.50

ARSENOPYRITE, Rezende Mines, S. Rhodesia. Massive. 2 x 2 x 1½ 1.25

SMITHSONITE, Joplin. Colored yellow by Greenockite, on rock 2½ x 2½ 1.25

CROCOITE, Tasmania. Mass of xls. 2 x 1½ x 1¼ 5.00

PROUSTITE, Freiberg. Xld. and Xlline. mass. 2 x 1¾ x 1½ (7 oz.) fine 30.00

THAUMASITE, Paterson. Xlline. mass. 3½ x 3 x 1½ 1.25

PECTOLITE, Paterson. Xld. w. mirco. terminations. 3½ x 2. Very good. .. 2.50

CERUSSITE, Tsumeb. Brilliant twin xls. on Malachite. 3½ x 2½ 6.00

CHABAZITE, Penna. Red xls. w. Stilbite on rock. 4 x 2½ 2.00

STILBITE, Moore's, N. J. **Orange** colored xls. on rock. 5 x 3 ..... 3.00

HEMATITE, Cumberland. Xld. on mass. Hematite w. Quartz xls. 3 x 2½ 2.50
Massive specimen portion of large "kidney". 3½ x 1½ 1.50

LUDWIGITE, Montana. Xlline. mass. 3½ x 3 ..... 1.50

GROSSULARITE v. ESSONITE, Maine. Xls. up to 1½" on rock. 3½ x 3 4.00

BARITE, Cumberland. Deep yellow xls. in parallel position 4 x 2 fine. .. 5.00

RUTILE Maryland. Xls. in Chlorite. 3½ x 2¼ 2.00

ARGENTITE, Freiberg. Very finely xld. 1½ x 1¾ 20.00

MERCURY & CINNABAR, Moschellandsberg. Minute globules. 2½ x 2½ 3.00

BROOKITE & OCTAHEDRITE, Somerville, Mass. Micro. xls. on rock. 2 x 1 1.50

SILVER, N. S. Wales. Xld. mass w. micro xls. Spessartite. 2½ x 2¼ 7 oz. 7.50

VESUVIANITE, Tyrol. Xld. in mass. 3 x 2 ..... 2.50

SIDERITE, Cornwall. Minute xls. on two sides of rock. 3 x 3 ..... 1.50

QUARTZ, Herkimer, N. Y. ⅞" xl. in matrix cavity. 2½ x 1½ 2.50

COVELLITE, Summitville, Colo. Xld. 2½ x 1¼ 3.00

APOPHYLLITE, Paterson. Group of opaque white xls 2½ x 2 ..... 2.00

CERUSSITE, Castle Dome, Ariz. Xls. up to ¼" fl. brilliant yellow under LW. on Calcite w. minute xls. of Wulfenite. 4 x 4 ..... 4.00

ANALCITE, Paterson. Glassy xls. on rock. 3 x 2½. Very good. 3.00

ARSENIC. Cornwall. Solid mass. 2½ x 2 (11 oz.) 2.50

GOETHITE, Ironwood, Mich. Small botryoidal w. silky luster. 3 x 2½ .. 1.50

SCHEELITE, Bohemia Small xls on Quartz xl. 1½ x 1½ 2.00

COOKEITE, Maine Pink w xld Quartz & Lepidolite. 3 x 2½. Good .. 2.50

CHABAZITE v. PHACOLITE. Bohemia. Xls. in rock. 3 x 2 ..... 2.00

XANTHOPHYLLITE v. VALUEVITE, Alaska. Xlline. in rock. 3 x 2½ .. 1.50

TALC, Mautern, Austria Rose pink mass. 6 x 3 ..... 1.50

APOPHYLLITE, French Creek, Pa. Small brilliant xls. on rock. 3 x 1½ .. 1.50

SPESSARTITE. Avondale, Pa. Large compound xl. w. Quartz. 4 x 3½ .. 3.50

BRAZILIANITE, Brazil. Xld. mass. 1¾ x ¾. Many xl. faces. 17.50

HUGH A. FORD

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No lists furnished, but enquiries for specific minerals welcomed.

ROCKS and MINERALS

PUBLISHED MONTHLY

Edited and Published by PETER ZODAC

AUGUST 1947

Contents for August, 1947

CHIPS FROM THE QUARRY 702
A FEW DISCONNECTED OBSERVATIONS UPON MATTERS GEOLOGICAL, BY AN AMATEUR, IN EGYPT. *By Claude H. Barlow* 703
AN UNUSUAL OCCURENCE FOR MALACHITE. *By Mark Robinson* 709
A CHERT OCCURENCE NEAR BERNE, *N. Y. By Peter Zodac* 709
FLINT RIDGE, OHIO. *By Marie S. Riley* 710
FIRST GOLD MINE OF THE UNITED STATES IS ON GEORGIA 713
INDUSTRIAL STORAGE BATTERY INTRODUCED BY BAKER & CO. 713
THE FINEST MINERAL SPECIMEN. *Bl Fain White King* 714
NORTH JERSEY MINERAL SOCIETY FIELD TRIP TO CONNECTICUT. *By Katherine B. Kauth* 716
HISTORIC U.S. IRON MINE RE-OPENS 717
NATIVE ARSENIC ONCE FOUND IN LOUISIANA 718
A CHECK-UP ON LOCALITIES OF THE HAMMOND QUADRANGLE, N. Y. *By Keith R. Dahlburg* 719
SOME MINERALS OF WOLFACH, GERMANY 721
MINERAL COLLECTIONS IN COLORADO SPRINGS RANK HIGH. *By J. K. Hailliburton* 722
SOME TROUBLES OF A ROCK HOUND. *By Samuel C. Brown* 724
PATTERSON ILLUSTRATES CRYSTAL SYMMETRY WITH WALLPAPER. *By Charles A. Belz* 725
APPOINTMENT TO ILLINOIS GEOLOGICAL SURVEY 727
MY OREGON COLLECTING EXPERIENCE. *By Ed. Duserik* 728
COLLECTING MINERALS IN 1847 729
MINERALS OF KAILUA, HAWAII 731
REMINISCING ON COLLINS HILL, CONN. *By David H. Seaman* 732
TILLY FOSTER, N. Y., STILL AN ACTIVE LOCALITY. *By Theodore Fredericks* 733
PLAGIOCLASE. HOW COME? *By W. Harold Tomlinson* 734
A NEW HOBBY. *By Ruth H. Wentworth* 735
EAST TO WEST AFTER CUTTING MATERIAL. *By Jean E. Wells* 736
VANADIUM 737
THE AMATEUR LAPIDARY. NEW INDUSTRY FOR ALBURQUE, N. MEX. 738
CLUB AND SOCIETY NOTES 740
THE CRITICS. *By Anthony Thurston* 743
WITH OUR DEALERS 744
INDEX TO AVERTISERS 800

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CHIPS FROM THE QUARRY

NORTHWEST FEDERATION OF MINERAL SOCIETIES CONVENTION, SEATTLE, WASH. AUGUST 30-31, 1947

The Gem Collectors' Club of Seattle, Wash., who are sponsoring the Convention of the Northwest Federation of Mineral Societies set for August 30th and 31st, look forward to a host of visiting rockhounds and friends. The sessions will take place at the Civic Auditorium.

In this hall there will be set up as fine a showing of individual and commercial displays as one could wish for. The quality and varied types of the material, for which space is being arranged, presage a convention that no rockhound will miss or soon forget.

At 9:00 a.m. on Saturday morning, August 30th, the program will begin, for the two-day session, ending at 5:00 p.m. on Sunday afternoon. Among the features at this program will be the raffling of a large diamond saw and also the raffling of a complete lapidary unit; this equipment was donated by the Lapidary Equipment Company of Seattle.

There are many places of interest, easily accessible from the Civic Auditorium, that rockhounds will want to see. The most outstanding of these is the Art Museum in Volunteer Park where visitors can see one of the finest collections of jade in our whole country.

All these things and places the members of the Gem Collectors' Club have in mind when they send greetings to all their friends, to come out and visit with them on August 30th and 31st, for a very pleasant association.

PAUL H. SOLL
Publicity Co-ordinator.

CORRECTION

The illustrations for Mr. John N. Trainer's article, "More on Uvarovite Garnet:", in the June issue of *Rocks and Minerals* were misplaced. They should have been reversed. The caption for the section of the full length specimen shown in Figure 1 should have read as follows: "Figure 2. A section of the specimen shown in Figure 1."

World's Deepest Borehole Down to 17,823 Feet

The world's deepest man-made hole, the Weller oilwell located 5 miles north of Fort Cobb, in Caddo County, of western Oklahoma, reached a depth of 17,823 feet on Sat. June 21, 1947. Whether the hole has been stopped permanently or is being deepened, we cannot learn but no doubt further information will be received shortly and will appear in the September issue of *Rocks and Minerals*.

Mr. Jay E. Gilkey, of Oklahoma City, Okla., is keeping *Rocks and Minerals* informed on the progress of this world-famous borehole.

For further information on the borehole see *Rocks and Minerals* for March (p. 206), April (p.306), and June (p.537) of this year.

Tickled Pink!

Editor R & M:

Tickled pink to renew subscription. Best 3 bucks I could spend.

Milton W. Avery
Hoboken, N. J.

July 1, 1947

ROCKS and MINERALS

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A FEW DISCONNECTED OBSERVATIONS UPON MATTERS GEOLOGICAL, BY AN AMATEUR, IN EGYPT.

By CLAUDE H. BARLOW, M.D., Sc.D.

Since 1927 I have been roaming around over the land of the Pharaos and have seen some things which others have not seen in the days and nights spent looking at the land. Egypt is specially suited to the study and observation of geology because only about 3% of the country is under cultivation while the remaining 97% is desert.

To the Geologist Egypt lies naked and unhidden over most of its area and one could spend lifetimes studying the surface only and then not exhaust the subject. The arable land of Egypt is about 35,000 square kilometers which leaves 965,000 square kilometers lying wide open for observation. Only about one eleventh of the desert floor is sand, the rest being gravel, rocky boulders or rocky strata of limestone, marl and clay rising from low plateaus to high mountains. Most of the areas north of Edfu are sedimentary and those south of Edfu are largely igneous rocks.

The sedimentary strata are a total of 700 meters thick and are composed of marine fossils, the commonest of which are probably nummulites of various species. These fossils attest the subsidence of a large part of Egypt to very considerable depths which lasted for millions of years during the Eocene period. Many escarpments along the wadis of both the Western and Eastern Deserts are almost solidly built of fossils. Some univalves vary in size from microscopic to specimens weighing several kilos. There is a richness in the variety of species which is almost unbelievable. The same thing is true of bivalves, foraminifera, corals, echinoderms, etc. Of the latter one sees perfect specimens of *Linthia, Echicnolampas, Schizagaster, Conoclypeus, Hemiaster* and other genera of lower eocene period. Some of these echinoderms have, instead of spines, wide inverted cones for locomation over ooze. There are fossil fish and fossil worms to catch them with. Away over in the Fayum Depression to the west of lake Karun, there are deposits of the great land animals, testudinates, reptilia, saurians, arsinotheria, mastodons and other fossils so near the surface that, in one instance, a nosehorner was discovered accidentally by a man who was just going to use the exposed tip for a golf tee. On the north shores of Lake Qarun (Karun) (Lake Moeris) I have found fossil remains of several genera of fish and of the Nile alligator as well as a few neolithic implements. The whole area around Lake Qarun is an interesting field of geological exploration which has hardly been touched. The Lake Qarun is deep down in a hole with cultivation to the south of the lake and bleak desert to the north. The Oasis is the largest oasis in Egypt and the richest.

Oasis of Kharga

The Oasis of Kharga lies 400 kilometers due south of Fayum and 200 west of the Nile. It is nearly 400 kilometers from north to south and about 50 kilometers wide but there are only 6 or 7 tiny areas of actual cultivation in that whole area because most of the ancient wells no longer produce enough water to keep crops alive. Kharga is fed agriculturally by deep artesian wells some of which were dug by the ancient Romans and are still in use. Some of the water comes from hot springs which are sweet or slightly brackish. To reach Kharga one leaves Oasis junction, which is just south of

Luxor, and travels by slow train (VERY slow) or by a fast trolley which looks like a big, open box-lorry on railway wheels. The trolley driver is a weathered old man, silent and reserved. On one trip I was giving a lift to a Medical Officer who was disgrunted because he had been "shoved off into that God-forsaken Oasis" when he wanted to be in Cairo. He sat by the side of the driver and wailed his wail. He told all and each that you couldn't find a decent cafe, pension or cinema. That there was nowhere to go and nothing to see. We were passing through one of those incomparably beautiful cuts in the plateau with the setting sun in a blaze of glory lighting up the edges of the escarpment till everybody had fallen silent with the wonder of it all. Everybody, that is, except the carp on the front seat. Finally the old Arab driver got fed up. With one hand on the throttle he turned to the young doctor at his side and sweeping his outflung arm to north, to south, to east, to west, he said: "No, we have no cinemas, no hotels, and no cafes, but if you are stuck in that hot stifling city of Masr (Cairo) you couldn't see THAT and THAT and THAT!!" Seldom have I heard a more scathing rebuke and it warmed the cockles of my heart. The route, due west of the Nile valley, passes through some of the most arid but beautiful desert one would wish to see. Deep-cut valleys, fantastic with wind and sun erosions and glowing in the morning sun with bright and varied colouring, lead out onto plains covered with small and large barkans or crescent-shaped sand dunes. These dunes are formed by constant direction winds and the horns of the crescent preceed the body of the dunes as they travel relentlessly over the desert floor. They cover villages and wells or palm groves or anything else which gets in their way and man has tried to control them by planting shrubs, heavy grasses or other desert plants along the windward edges. These makeshifts only hinder the relentless march of the dune a little. It occurs to me that the dune could easily be shifted at will by the use of sailcloth walls set at such an angle to the dune as to give direction to the wind before it reaches the dune and thus change direction of the drifting sand to steer it around the villages or wells until the dune is past and then allowing the prevailing wind to take its own will with the sand. The canvas should be set leaning slightly away from the wind in order to guide the wind upward as well as at an angle. The canvas should be stayed much as the side-walls of the big top are stayed. That this method works I am sure because I have done it on an experimental scale on the desert itself.

Sand areas make beautiful pictures

While on the subject of sand, there is no element, not even waves of the sea, which show beauty of rythm and design as wind driven sand. For beautiful photography the pictures should be taken in early morning or late afternoon, so that the sand ripples cast their shadows to give the best contrast. Using an aeronometer, a set of standard sieves and a meter stick, I found some interesting things concerning the sand. If one knows the wind speed and the size of the sand grains and the distance between the ripples a definite relationship comes to light between the three factors. If you have distance between the ripples and grain size you can predict the speed of the wind. If you have wind speed and grain size you can predict the distance between the ripples etc. Then there are few more charming sand pictures than the tracks of animals and insects as they roam over the wind blown sands. Birds, lizards, sand vipers, beetles, locusts, silver fish, ants, foxes, mice, jerbils and all the citizenry of the desert leave their tracks and their record of tragedy, comedy, and love. Sand and grass and desert shrub combine to make lovely pictures.

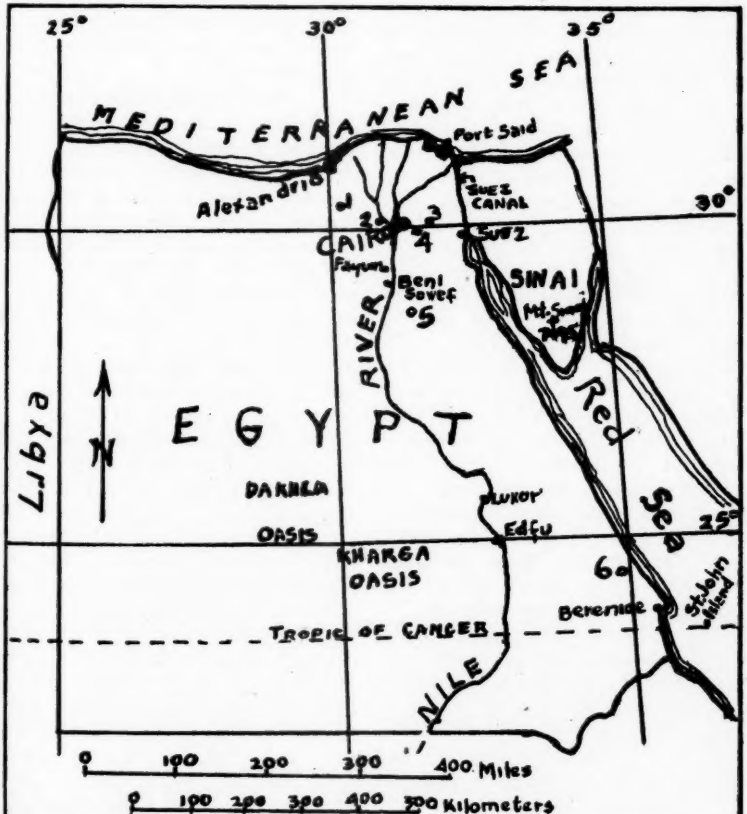
A locality noted for concretions

Before reaching Kharga there is a wadi which reaches down to the railway and extends into the distance as far as one can see. It is called the wadi Battikh or the wadi of the watermelons. Scattered all over the floor of the wadi are spherical concretions from fist size to larger than a watermelon. Most of the stone melons lie entirely exposed, some are still attached to the rocky floor and still others lie al-

most embedded in the softer limestone strata which form the floor of the wadi. In an evening light and at a little distance they look quite like thickly scattered watermelons. Some are too heavy even to roll and some could be thrown at a hyena. Some have been evenly split into hemispheres which show the concentric layers of their formation. Some of these hemispheres show sand-blast erosion of the softer layers, giving a most pleasing effect called sand-sculpturing. This sand-sculpturing is seen in all broken rock fragments and produces fantastic and beautiful shapes. Nearly all of these stones are three-faced by the sand-blast action of the wind. One face gradually flattens and the stone is over-balanced as the sand is cut from under it and it falls into the depression leaving an uncut face presenting to the wind-driven sand. This process is repeated until three sides are flattened. The stones as they fall irregularly leave roughly three-sided pyramids. Many of them take on a high desert polish.

Gypsum, quartz and sand barite localities

To the southeast of Kharga Oasis there is a great deal of gypsum glistening on the desert floor and one runs across large aggregates of fine selenite crystals in the Nubian sandstone. One also finds flints, jaspers, chalcedony and agates as well as



Map of Egypt showing some mineral localities

1—Natron Lakes
2—Abu Roash
3—Heliopolis
4—Petrified Forest
5—Alabastrum
6—Emerald Mines

many quartz crystals. Farther north in the Baharia Oasis sand barite crystals are found in the Nubian Sandstone and there must be some in Kharga as the geologic formation is the same as at Baharia.

Dakhla Oasis and its minerals

West of Kharga lies Dakhla Oasis, about 200 kilometers from Kharga. The Dakhla Oasis is the most important after the Fayum. It has many wells and a good deal of land under cultivation. The cultivation is in and around villages which are separated from each other by areas of desert. The walls of the Oasis valley are deepcut from the surrounding plateau and form steep escarpments. These walls are in many places varicolored in tints of iron compounds running from its lowest to its highest valences. In some of the wadis the colours are so bright and varied that they have been called the "Painted Wadis". There are large deposits of good grade ochre which grades in color from very pale yellow to browns and reds through to caput mortem. I have collected large samples of these ochres, washed, levigated and graded these samples and then mixed them with oils. The resulting oil colours were used in painting Dakhla landscapes. There is one warm spring which is slightly sulphurous. The whole area abounds in fossils. West of Dakhla lie great parallel dunes of sand running north and south and impassable to any but cars fitted with big sand wheels. It is along one of these sand valleys that meteoric glass is found in enormous amounts. The theory is that a meteor went romping along the sands and whenever it touched it burned the sand to silicon glass. I have several pieces of this glass. Some pieces I have worked into clear cabochons and they look very like aquamarines. One of these clear yellowish tinted cabochons I heated to white heat and then plunged into cold water without any appreciable effect in the stone.

Celestite localities

Abu Roash (Ró ash') is on the western desert just a little way north of the Giza Pyramids. It is a continuation of the same desert floor as the Moqqatm (Mokattam) of the eastern desert, the river Nile having cut out its valley in the plateau and then silted up on each side. Both sides show the same species of nummulites and other fossils. There are some celestite crystals to be found occurring as psudomorphs after fossils such as *Nautilus, Fusus,* etc. in limestone. To the west of the pyramids a short distance there is a marble quarry where a very good grade of marble is mined. Across the Nile from Abu Roash and beginning at the east of Cairo lies the other end of the same range of hills as are found at Abu Roash. This range is called the Moqqatm. Here one finds well crystallized specimens of Celestite associated with the shallow water upper Mokattam beds in the Mokattam hills.

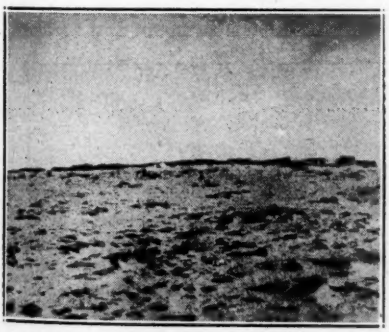
The Petrified Forest of Egypt

The Mokattam range of hills is as interesting a deposit as one could wish to find of almost endless species of fossils, petrified wood, jaspers, agates, gypsum, quartzes, worm casts, limestone ridges, sandstone deposits etc. The Moqqatm is cut and eroded into deep wadis with almost perpendicular walls or gently sloping sides and wide wadi floors. The main direction of flow of the wadis is towards the Nile. Half an hour's drive to the N.E. of Maadi up the Wadi Ty (or Ti) one comes to the Wadi Khashib (The Wood Wadi) or Petrified Forest. This is about the center of the Eastern Petrified Forest and it covers an area of about 20 square kilometers. But one should begin as far down as the Wadi Gindali or farther to reach the eastern end of the petrified forest. If one follows the general direction of the petrified forest across the Nile valley we come to the Western Petrified Forest which is in fact merely the western end of the eastern petrified forest. It extends for many kilometers into the Western Desert. Farther up the river at el Saff I have found petrified palm, but not in the petrified forests. There are two theories with regard to the formation of these forests. One is that the trees were brought in by the tide and left scattered along the coast where the silica replacement took place. The other is

that they lie as they fell from standing trees and were later petrified. I am inclined to the latter theory because of the position of the logs. They are of considerable length some as great as thirty meters and they do not lie parallel as they would if brought in by waves but they lie at all angles to each other scattered over the hill tops just as would occur in an ordinary windfall, such as one sees in the Michigan logging country. The trees are segmented trunks and are usually found lying with the segments separated. Some trees are continuous logs and are almost perfect from stump to top but without rootlets or small branches. Barron "Cairo —Suez" gives the following genera and species:

Araucarioxylon aegyptiacum
Palmyloxolon aschersoni
Nicolia aegyptiaca
Laurnoxylon primigenium
Acacioxlyon antiquum
Capparidoxylon geinitzi
Dombeyoxylon aegyptiacum
Ficuxylon cretaceum.

In the Fayoum depression north of Lake Karun on an old paleolithic site I found a petrified-palm corn-grinding stone but I did not find the mortar. The palm structure was very plain and the stone had been so shaped that the force of the grinding should come upon the ends of the fibres. The stone was nicely shaped to fit the grinder's hand.



A view in Egypt's famous Petrified Forest (Eastern). In extreme background is a large petrified tree, 100 feet long. The area is dotted with small to large pieces of petrified wood (which looks black in the picture.) The presence of the many masses of petrifiel wood indicates clearly that rockhounds do not exist in Egypt.

Alabaster locality at Alabastrum

During the reign of Mohammed Ali el Kebir a mosque was built in Cairo on one of the hills of the Moqqatm range alongside of the Citadel. The mosque is called the Mosque of Mohammed Ali and the alabaster was mined at the old site of Alabastrum, an ancient Roman mine. The village of Alabastrum no longer exists but alabaster is still worked there and many slabs of more than a meter are to be seen. The alabaster is of poor quality, having "rotten" spots of iron tinged geodes. Alabastrum is about 140 kilometers almost due south of Cairo and 30 kilometers due east of the Nile. Its latitude and longitude are 28° 8 by 31° 3. It is about 35 kilometers S. E. of Beni Souef. The mines as such are no longer worked but some alabaster is got out by people wishing amounts for making ornaments and faked antiques.

Egypt noted for its jaspers

All over the sedimentary plains of Egypt one finds jasper pebbles ranging in size from a BB shot to stones half a meter long. Many of these pebbles are plain structured while many are banded and concentric. They range in colour from pure white through the yellows and reds to black. Blue is a rare colour. They are cryptocrystalline silicon dioxide and the

Dr. Barlow, the author, pauses to rest on a petrified tree stump in the famous Petrified Forest (Eastern) of Egypt. Note the many large masses of petrified wood scattered about.

colours are due to iron and copper. They contain dendrites of manganese. Most of the pebbles are water-worn and amygdaloidal in shape. Many of them show well formed geodes containing large or small quartz crystals, an occasional fossil, and iron-tinged sand to dust. On hill-tops near the Bir Gindali I have found the largest and most of these stones are very deep brown due to sunburn. Also many of these jaspers are covered with lichens, of various species, which serve as food for large snails of the genera Eremina. These snails may be found clinging to stones which register a temperature of over 150° Fahr. At night dew falls and the lichens become soft and edible. These snails have been known to live for eight years without food or water. They go the camel one better. These jaspers are often fractured by the heat or the cold and also by the action of water upon infiltrated salts. The fracture is conchoidal and the stone is opaque to the very edge of the fracture. They cut and polish well and one finds an infinite variety of line and colour which makes them most acceptable as lapidary material. The Ancient Egyptians e teemed white jasper above all other stones, when the white was of clear quality. The sites of the best of these jaspers are, the Khanka Sand Dunes near Heliopolis, the Western Desert just to the west of the pyramids of Giza, the Wadi Gindali and about 20 kilometers from the Wadi Ramlah on the road between the Wadi Gindali and the Wadi Ramla (Wadi Ramli, etc.) and at points along the Cairo Suez road.

Jaspers on plain at Bir Gindali. The loose rounded pebbles are jaspers. Bir Gindali is about 30 miles southeast of Cairo.

Ancient emerald mines near the Red Sea

The ancient emerald (beryl) mines were near the red sea coast about due east of Edfu (Idfu) and located at Sikait (Saket) Zabara and Um Kabu where there were extensive workings. The emerald occurs in a dark mica schist but it is not commercially mined at the present time. Edfu is on the Nile between Luxor and Asswan (Assuan) at 25° N and 33° E.

Agates from Edfu Gravel Pits

There are extensive gravel pits just outside of Edfu in which some very fine, clear, colourful agates are to be found. There is a theory that the agate workers of ancient Egypt located at the temple of Karnak, got their material from Edfu. I have collected scores of agate pebbles and fractured agates from the dust piles around Karnak and the Medinet Habu temple and they do not conform to the agates found at Edfu but appear to come from Abu Hammad in the Delta. They appear to have been heated to intensify the colour but otherwise they look more like the Abu Hammad agates in texture and structure. There is clearness and banding like those found at Abu Hammad.

Visit Egypt—An Invitation!

There is so much to see, so much to discover, so much to learn, and so much

Jaspers in Wadi Iss Dude, near Bir Gindali

to tell one hesitates even to begin on the geology of this most interesting country. When you have time come along over and take a Rocks and Minerals trip and don't forget your hammer and rucksack; we will supply you with water from the river Nile for your trips into the desert because, though the desert is a place of beauty and interest, it is also a place of menace and danger.

Editor's Note: A wadi is a dry watercourse. A kilometer equals 3,280.8 feet.

AN UNUSUAL OCCURRENCE FOR MALACHITE

By MARK ROBINSON
Springfield, Pennsylvania

A female specimen of *Plusiotus lecontei* Horn (Coleoptera) from Sierra Madre Mountains, Chihuahua, Mexico, collected on August 1, 1902, has the abdominal cavity partially filled with rosettes of microscopical, slender, acicular crystals of malachite. This specimen is 29 mm. long; and 17 mm. wide and is a bright green color externally. In nature specimens of this genus feed on the leaves of Oak, Aspen, Pine and various other trees and are very much desired by collectors because of their size and bright colors. This insect after being caught was pinned through the elytra and abdomen with a brass pin.

The fermentation of the plant tissue in the insect's stomach formed carbon dioxide in the presence of the copper in the brass pin and formed a copper carbonate or to make it short, "a belly full of malachite". It is common to find insects pinned with a brass pin with verdigris or malachite about the pin but I know of no other instance where the malachite was crystallized as it has in this case.

To find the above phenomena was simple compared to a most perplexing one, as I am in possession of an insect collection and a micro mineral collection. I am in a quandary as to which collection this specimen should be deposited. Perhaps some collector will help me with this problem.

A CHERT OCCURRENCE NEAR BERNE, N. Y.

By PETER ZODAC

Chert, a compact flinty variety of quartz, is quite a common mineral in New York and an interesting occurrence is near Berne, in the eastern part of the state.

The mineral occurs in a road metal quarry adjacent to the south edge of N. Y. Rt. 43 on the eastern extremity of Berne. The quarry is about 300 feet long, averages 35 feet in width and 10 feet in height at the face. The rock is a dark gray compact limestone (Onondaga limestone). The chert is present in the quarry as small horizontal and parallel veins, 4 inches thick and dark gray in color.

The only other mineral seen was calcite which occurs as small white and also black, crystalline veins in the limestone, 2 or 3 inches thick.

Berne, a small village, is in the western part of Albany County.

INVEST IN GOOD MINERALS . . .
BUY THE BEST.

FLINT RIDGE, OHIO

BY MARIE S. RILEY

R. F. D. No. 2

Springfield, Ohio

We first became interested in rock hunting as a hobby during the summer of 1940. The following year was spent pretty largely in reading and studying the subject. We found that the best way to keep up-to-date was to subscribe to some mineral magazines. One of the best being *Rocks & Minerals*. We made another trip west the fall of 1941, then came December 7th and Pearl Harbor, and shortly there after, gas rationing. It looked as though our new hobby was going to die a-borning, for we thought we had to travel to far fields to find anything worth while. We tried to resign ourselves, thinking the war could not last forever, and when it was over, we would travel again. My husband took a few business trips by train and I got a job as a bookkeeper with a local concern. We continued to read and make a list of localities to visit in the future. We sent for all the back numbers of the mineral magazines and there we discovered that right under our noses, so to speak, we had a fine locality and one that had never been given much publicity. It was Flint Ridge (sometimes called Indian Ridge), in Muskingum and Licking counties, located about half-way between Newark and Zanesville in central Ohio.

On one of our trips through Misouri we had stopped at Joplin to visit the collection of Boodle Lane and found he had made a gift of considerable size to the Museum of Ohio University at Columbus. By being very saving with our gasoline, we managed a trip to Columbus to see this collection and to our surprise, found also a beautiful collection of cabochons made from the "flint" as we were then calling it, from Flint Ridge. Now we knew, somehow or other, we must manage a trip to the Ridge.

Our First Trip To Flint Ridge

Our first trip over was made in the Spring of 1943. A nice day in early April. We left Springfield on Saturday after I got off from work and drove to Newark, where we spent the night in one of their very comfortable hotels. The next morning we got up early, had a lunch packed at a near-by restaurant, filled our vacuum bottles with hot coffee and headed for the ridge. It's only 13 miles, and although the country is quite hilly, the road is good. Arriving at the Park, we set out to see what we would see. During the depression years the CCC boys had cut trails through the woods, built shelter houses and outdoor fire places in the picnic area. The whole Ridge, so we were told, is only about eight miles long. At its widest point it is about two miles across and at places only a few feet. The Park is right in the center, covering some 20 or 25 acres, and the area where the best flint is found. In this Park are numerous pits the Indians had dug. They built a fire on the rock, after removing soil and vegetation, then when the rock was red hot, cold water was dashed on it, and the flint was split out in chunks. It was then carried to a ravine which was their workshop, and there it was fashioned into weapons, skin scrapers, ornaments, etc. One of the early munitions factories. Arrowheads from here were used as barter and can be found in many of the surrounding states. A year or so ago I found an arrowhead in Texas that looked exactly like the Ohio flint and since there was no rock in that vicinity that looked the least bit like the arrowhead found, it's reasonable to suppose that that particular piece had passed through many hands and was finally lost in Texas. The Ridge was neutral ground and all the local tribes could come there for their supply of weapons. This layer of rock varies in depth from a foot or two to many feet. When the Indians had dug through the layer, that pit would be abandoned and a new one opened up. Now the pits are choked with soil and undergrowth and it is impossible

to find even a single piece of flint. At the workshop there are many bright colored slivers that give one a pretty good idea of what to look for, but nothing that was worth saving.

We Make Our First Find

Practically all the land surrounding the Park, about 800 acres, is owned by a wealthy stove manufacturer in Newark. He allows to trespassing, so we were beginning to wonder if our trip was going to net us anything at all to take. In crossing the road from the picnic ground to the Park, we saw some nicely colored pieces in the road, so we started looking in the cut banks on each side of the highway, and then our search was rewarded. Some of the material was gray flint., which, of course, was not worth picking up, but there were also many pieces of yellow, red, blue, purple and pink that were breathtaking in their loveliness. There were patterns, stripes and solid colors. Many with strips of clear or banded agate. Many had crystal vugs. No two pieces alike. The thin pieces were translucent. None were entirely opaque. We could not believe this was just flint. The road men must have wondered who had been scratching at their roadway. Some of the finest pieces were dug out of the gravel road where they had been polished by the passing automobile tires.

There is a crossroads at the Park, so we had considerable area over which to look. On the road going north there is a cut some 15 feet deep. About half-way up this bank my husband saw something shining. He climbed up to it, and with his rock hammer dug out a very fine crystal cluster, about five inches square. The crystals are perfectly terminated and are about one inch in diameter. We found a few more smaller clusters but this group was the finest, even larger than the ones on display at the Museum at Ohio State, so we were quite elated.

Some of the designs in this material are almost perfect pictures. We have one that is exactly like a sitting cat, and another that is an Indian tepee. The more we found the more we felt that calling this material flint was misleading, so we sent a few pieces to Dr. Dake at Portland, Oregon, and he agreed with us and said he felt it was as fine a jasper as he had ever seen, so we dropped the flint and in the future spoke of it as jasper, which is much more descriptive.

We must have been the first rock collectors to visit the Park in many, many years, for had there been others, we wouldn't have found these fine pieces right in the road. We knew of a Mr. Schiefer in Cleveland that has qiute a collection of cabochons and was told that he had made a gift of them to Field (now Chicago Natural History Museum), although we have never seen them there, though we have looked many times. He made that collection several years ago and since that time, there couldn't have been much interest. We picked up a lot that was worthless, as we found out when we got it home. The gray pieces weather in a very colorful manner. They turn dark red, yellow and brown with an iridescence of green and blue. We thought we had something and did not know enough to chip them to see if the color went through. It didn't. On the surface only. There were a few pieces with dendritic markings. Interesting as specimens but of no value as a gem material.

This was the first of many trips to Flint Ridge. Our hobby had something on which to feed until we could travel farther.

The jasper found in Flint Ridge is a very hard, compact material and takes as long for a diamond saw to cut through as it does agate. Having found a hundred pounds or so on our first trip, our next job was to sort it, discarding the less colorful and fractured pieces. Then Mr. Riley sawed up a few pieces into cabochon blanks, ground and polished them. They took a brilliant polish, equal to any jasper found in the west. We made plans to go back as often as gas rationing would allow.

Old Coal Mine In The Area

On one of our trips, we stopped by the side of the road leading up to the Ridge. A farmer was making hay in the adjacent field and seeing us hunting along the road side, he came over, introduced himself and told us we were quite welcome to look

in his field and on the edge of his woods where he had found several crystal clusters. We learned that his father had owned the farm before him and he told us of a mine of cannel coal on the back acres of the farm. He said, in the past, they had mined the coal when they had nothing else to do in winter and it furnished all the fuel they needed. The early settlers had also distilled kerosene from the coal, so it had furnished light as well as heat. In late years it had seemed too much trouble and the mine had been abandoned. After abandonment of coal mining by the settlers, an eastern coal mining company had bought up many acres, intending to work it commercially. It did not prove profitable, so they, too, gave up the idea. It was from the eastern mine owners that the stove manufacturer in Newark had been able to acquire such a large acreage. The farmer directed us to a side road that led around to an old mine entrance. We found a few pieces of good grade cannel coal that took a pretty good polish. It had been so long since any fresh coal had been brought out, and that lying around had mostly disintegrated, or become too dull and lifeless looking to be worth anything.

Our farmer friend also owned a little old log house on the northwest corner of the crossroads, situated on a five acre plot of ground. He gave us permission to hunt there for jasper. We would have liked to own the little old house, but it had come to his wife as a gift for having befriended the old man that originally owned it, and they didn't wish to part with it. By-the-way, later it caught fire and burned to the ground.

Lake In Old Quarry Hole

To the east of the picnic ground is a small lake formed many years ago when the early settlers quarried the flint to use as mill stones. This lake and small field were not posted, so we could also hunt there. We soon found that we were not going to find any large pieces of gem quality. The lake was and is used by the local people as a swimming hole and fishing ground. Someone had stocked it with fish, and they're still there for we have watched them come to the surface when feeding. Since we are rock hunters and not fishermen, we never did try to catch them. After our first trip we came prepared to cook our meals over an outdoor fire place. After picking up and carrying stones to the car for a forenoon, a meal of hamburgers with fried onions and fried potatoes with lots of freshly made hot coffee was our idea of Heaven. Never had food tasted so good!

As we came more and more often, we became a familiar sight to the local residents. West of the cross-roads on another small five acre plot lived a man employed as a watchman or caretaker for the stove magnate. He was very friendly to us. He had sent some jasper to the Geological Department of Ohio State so knew the quality we were hunting. He told us that if we could come back in the fall after he had harvested his garden, we were welcome to anything we might find on his place. It was just a nuisance to him, as it interfered with his plowing and hoeing and he was glad to have it picked up. We were not able to get back in the early fall, and the day we did go, the temperature was down to about ten above zero. We put on all the heavy clothes we could find and still we were cold. No, we didn't cook outside that day, although we have cooked outside on the shore of Lake Superior when the temperture was zero. What fools rockhounds be! We either freeze or melt. Never does it seem to be just right. Yet we keep on.

Gold And Oil Found In Area

There are many springs of fine pure water scattered over the Ridge. Many years ago someone noticed that the bottoms of the pools that formed at the springs contained black sand, so being very enterprising, they decided to pan them for gold. And they do tell us that a trace or so was found, but nothing of any value. However, gold of another kind was found. Black gold. Oil wells were drilled and were pumped for some time. Some few of the wells are still in operation, but by far the greater number are pumped out.

Down over the Ridge to the south and west we found a tumble down cabin by the side of a fine spring. The house and spring house had been built of hand hewn

logs and the chimney and fireplace were built of flint. Traces of the garden were still visible. There were roses, hollyhocks and peonies that had been set out by some pioneer woman. You just knew she had been happy there and had a fine thoughtful husband, for the house was near the spring and had been built in a grassy valley where it would get the warm sun and still be protected from the winter winds by the hills and forest. On the hillside is an apple orchard. We have been there in the spring when those old trees were in bloom and it is a place of enchantment, peopled by all the spirits of those that have lived and loved there before. If you go there and find this spot, I hope you will be alone and will sit down on an outcropping of flint, or lie on the thick green grass, in the warm spring sun, with the smell of the good earth and apple blossoms in your nostrils, the sound of bird songs and rippling water in your ears, the feel of a soft southern breeze enveloping you, let yourself drop off to sleep, if you have time, and know perfect contentment.

Flint Ridge Easy To Find

Flint Ridge is an easy spot to find. If you will look on a road map of Ohio, you will find it printed in red. Flint Ridge State Memorial. It is on State Route 668 about half way between State Route 16 and U. S. Highway 40. All Ohio gravel roads are good, so whenever you go, you will have no trouble. You will surely be rewarded by finding a few pieces and you will have a pleasant place to visit. As I have told you, the picnic ground has plenty of fire places, with wood provided, tables and a large shelter house, if a shower should come up. There is a well of the best water I have ever tasted which is perfectly safe to use and adequate rest rooms. If you have traveled in Ohio, you will know of the fine roadside parks, and will know what to expect.

As a native daughter of the state of Ohio, I extend to my readers a cordial invitation to visit this locality and feel sure you will not be disappointed.

First Gold Mine of United States Is in Georgia

The first gold mine opened up in the United States is said to have been the Columbia mine of northeastern Georgia. The mine is about 11 miles northwest of Thomson, the county seat of McDuffie County, and on the Georgia railroad. It is one of the most extensively operated deep gold mines of the state.

The veins, which consist of auriferous milky quartz, oftentimes the quartz shows native gold, occur in a fine grained sericitic schist.

Chalcopyrite, galena, pyrite, and pyromorphite are found in the vein.

Industrial Storage Battery Introduced By Baker & Co.

NEWARK, N. J.—A cadmium nickel alkaline storage battery which combines advantages of lead acid and nickel iron alkaline batteries is being introduced to industry by Baker and Company, Inc., refiners of precious metals here. Baker has a background of engineering, refining and manufacturing experience going back to 1885.

Used in Europe for the past twenty years, the cadmium battery has been perfected by Baker technicians to fit the needs of a wide variety of industries, including marine, railway communications, food processing, radio and radar, and others.

Chief benefit of the battery, the company states, is that it accomplishes alone what was formerly done by a lead acid battery and nickel iron alkaline battery, in addition to possessing features of its own.

The Baker battery accepts high or low charge rates with no finish rate limitations. it is pointed out, and has excellent capacities at low electrolyte temperatures with no danger of damage due to freezing. It has a minimum spread between its charge and discharge voltages and is ideal for "floating" service applications. The battery has low internal resistance and will not self-discharge on open circuits.

The Baker battery is sturdily constructed of heavy, nickel-plated steel to withstand mechanical abuses. The active material is held firmly in perforated steel pockets to prevent shedding. There are no fumes to corrode steel or wood, thus making special installation precautions unnecessary, it was stated.

WANTED: Correspondents in all parts of the world who will be kind enough to send us notes and news items on minerals, etc., that they think may be interesting to the readers of *Rocks and Minerals.*

THE FINEST MINERAL SPECIMEN

By FAIN WHITE KING
2700 Washington Ave., Cairo, Ill.

Mineral specimens are found all over the world, on the surface, in mines and dumps, and in private and museum collections, therefore, when the assertion is made, "the finest", much territory is covered. The natural reaction to such a statement, is it true or just the secure remark of an insecure position prompted from lack of experience, knowledge, or plain ignorance. The purpose of the title is twofold. First, the desire and hope that the collectors and institutions will refute the allegation and describe for the benefit of all, their fine material. Second, focus attention toward the beautiful superb works of nature in the field of mineralogy. In recent years the various mineral magazines and publications have stressed the many trips to mine dumps which is good for an outing but poor for obtaining rare splendid items except in small amounts. The only way to secure the best is through some local collector who has spent years sorting and collecting or through a specialist who has spent his life acquiring, buying, and comparing his acquisitions with other specimens from his district or from elsewhere that produce like minerals. No stranger can go into a new territory and find as good quality as the poorest collection contains. Mine dumps do not produce extraordinary undamaged perfect quality crystals except occasionally in a limited way. A few dollars spent with a good mineral house will give more pleasure and better results.

To select a piece roughly 12x12 inches only a couple inches thick from pieces weighing hundreds of pounds from the Kentucky-Illinois fluorite district or to ignore a massive 300 lb. Tri-State perfect galena, sphalerite, chalcopyrite example and not consider an 80 lb. blue barite crystal cluster from Missouri, disregard hundreds of exceptional crystal groups in a collection of 20 tons or more of small and large crystal groups of calcite, fluorite, pyrite and associated minerals is because nature chose to concentrate her beauty and diversification in a limited space, 12x12 inches.

The contrast of black and white is pleasant to the eye and a cause of surprise. On a field of white glittering quartz crystals, almost black fluorite crystals are interspersed with contrasting groups, prearranged as it were of other quartz crystal groups. The fluorite cubes are in size from two inches to smaller. The quartz from a quarter-inch and smaller. In the center is an inverted pyramid or pile of alternating groups of fluorite crystals and quartz crystal groups, black and white. Light blue is the common color in the fluorite of the Kentucky-Illinois district. It is most unusual to find almost black fluorite, too, quartz and fluorite in association is uncommon. The flat surface of quartz crystals has an indication of a primary and secondary deposition at different times of these quartz crystals. There are examples of doubly terminated quartz crystals, group terminations, singles, tabular and most of the forms so sought after by quartz crystal collectors.

The usual form of galena is cubic but in this case a single crystal of galena is crystallized into the rare octahedron shape and implanted atop a group of quartz crystals. Sphalerite occurs in three distinct types, massive, crystallized, and in globular form. The crystals almost black and known as ruby zinc, the other is a dark brownish color. A rosette of sphalerite crystals is in the center of a higher quartz group crystals, very much like the dark part of a white rose with its light petals. Over the surface of the fluorite cubes scattered in limited amounts are crystals of marcasite contrasting their golden color against the almost black background of the fluorite. Similar in amounts to pepper on a fried egg.

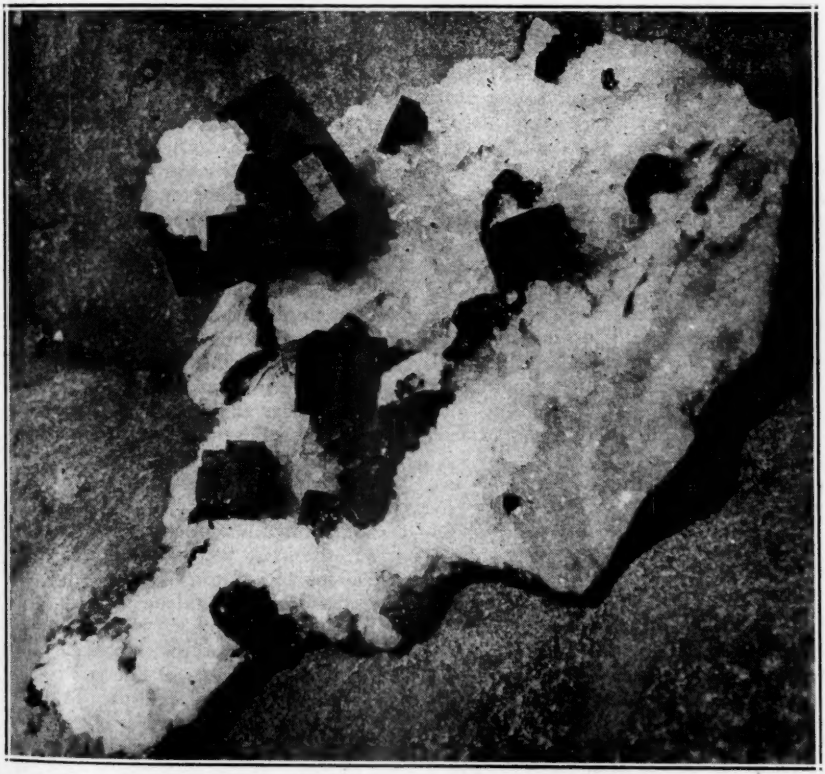
The fluorite cubes contain phantoms which is not often found. These show when a strong light is forced through the dark structure. Penetrating cubes of doubles and multiples of fluorite occur on the quartz crystal with a few single cubes of fluorite, these being almost square in measurement.

Quartz is not fluorescent unless it has

inclusions which react to either long or short wave ultra-violet stimulation. Little of the Kentucky-Illinois fluorite is fluorescent although the Western United States, Clay Center, Ohio, and British fluorites have this property. In the specimen under discussion, both the quartz and fluorite is fluorescent, long and short wave. The fluorite is cobalt blue by long wave, a light blue in its reaction under the Mineralight. Long and short wave produce similar results in the quartz crystals which is rather startling, in that the quartz contains inclusions of oil or petroleum. These inclusions cannot be seen with a high powered glass and do not discolor the quartz as the tiny specks or globular forms are so very small in size, however, when tested under either length wave, thousands of these are to be seen giving the quartz a white or whitish yellow reaction. There is a concentration of these in places which produce a stronger yellow color, this being found in the original deposition of quartz crystals. The secondary quartz crystals display a pinkish reaction which may be some other type of activator which causes this luminosity.

To summarize the qualities of the finest mineral specimen. It has beauty, is a masterpiece of nature building, diversifications of types and kinds of minerals, is fluorescent, and a pleasure to behold.

This very fine specimen comes from a small mine four miles east of Cave-in Rock in southeastern Illinois. Cave-in-Rock, a small village in southeastern Hardin County, is noted for its fluorite mines.



This very fine specimen of fluorite, galena, marcasite and sphalerite on quartz (all minerals in very good crystals) was found in a small fluorite mine, four miles east of Cave-in-Rock, Illinois.

THE NORTH JERSEY MINERALOGICAL SOCIETY ENJOYS ANNUAL FIELD TRIP TO THREE CONNECTICUT QUARRIES

By KATHERINE B. KAUTH
336 Hamilton Ave., Paterson, N. J.

Nineteen members of the North Jersey Mineralogical Society assembled in cars at the Paterson Museum early Saturday morning, June 28th, 1947, in preparation for a two-day field trip to three Connecticut feldspar quarries.

Though the weather promised to be unusually warm, to the highly enthusiastic members, heat was no obstacle, and could not dampen their spirits.

Leaving the Museum shortly before 8 o'clock, with cars decorated with red and white streamers for identification purposes, the group proceeded to the Gillette Quarry at Haddam Neck near Portland, Connecticut, stopping only to secure cabins for the night.

Arriving at the quarry about 12 o'clock, a happy but hungry people seated themselves on the ground, in a shady spot underneath the trees, and partook of a quick picnic lunch.

With renewed vigor and appetites appeased, the members then, with hammers, chisels, and magnifiers, set to work in the terrific heat of the sun, to search for interesting mineral specimens among the great piles of discarded materials of the now abandoned feldspar quarry. Specimens of aquamarine and morganite beryl, feldspar crystals, apatite, tourmaline, quartz, white feldspar, garnet, and mica were found by the North Jersey Mineralogists at this quarry.

Only with difficulty, can one now find good mineral specimens, for the Gillette Quarry has become well nigh exhausted.

Paul Kellinghausen of Elizabeth, by unusual patience and hard work, succeeded, toward the end of the day, in finding several fine specimens of aquamarine, and his enthusiasm attracted the attention of the entire group, which long before, had searched in the same region, only to have discovered nothing.

Gladly he shared many small specimens of his find, with the members. Mr. Kellinghausen at work, presented quite an occasion for camera fans, and several pictures of this scene were taken. A pet phrase of Mr. Kellinghausen, regarding success in prospecting during the day was, "Stay where you are and dig deeply!" It was with reluctance that the group finally left the scene of Paul Kellinghausen's find but, as it was gettting late, they wended their way back to the cabins to refresh themselves for a hearty evening meal at the Garden Restaurant in Middletown, Connecticut.

It was suspected that some of the members had found fluorescent minerals at the Gillette Quarry. Therefore, after the meal, it was agreed that each one display on the porches of cabins #9 and #10, his mineral find for the day. Miro Bianchi's fluorescent light was turned on the minerals and eager eyes quickly detected many specimens which fluoresced. This get-together, to observe fluorescent minerals, concluded the program for the first day and the happy mineralogists, for the most part, retired for the night. A few returned once more, to the quarry, to see if they could more easily detect the fluorescent minerals at night, but were disappointed at finding naught.

The prize specimens found at the Gillette Quarry were as follows: an apatite crystal discovered by Joseph Skaritza of Wyckoff, crystals of morganite obtained by Wesley Hayes of Irvington, and aquamarine crystals found by Paul Kellinghausen.

Sunday morning found the group up early. Breakfast was eaten at the cabin restaurant and plans were made to visit the abandoned Strickland Quarry near Portland, Connecticut.

It is known that the Strickland and Gillette Quarries were at one time operated commercially for feldspar. Feldspar of the Strickland Quarry was used especially in the manufacture of ceramics for glazing, and for abrasives in soap and powders. Mica found here was used for insulation purposes. Of the two quarries,

the Strickland Quarry is the larger.

At this quarry were found fine specimens of lepidolite, both pink and white; cleavelandite, and mica; also fine-grained mica schist and gneiss.

By climbing atop one of the steep waste dumps in this quarry, a few members obtained a delightful view of the surrounding panorama, and so—added sight-seeing to their mineral hunt.

There was still time for one more visit, so at noon, to the picturesque Hale Quarry, now in operation, the group proceeded, led by Leonard Morgan.

Here were found especially, torbernite and microscopic garnets.

Before making the trip homeward, a co-operative-sort of picnic-lunch was arranged at the quarry. What a variety of food that provided! Fruit juices, sandwiches, crackers and cheese, olives, cup cakes, doughnuts, bananas, apple, oranges, cherries, and plums—and these were but contributions received, as various members emptied their lunch boxes of their remaining contents. In jovial spirit, the North Jersey Mineralogists feasted.

As a climax to the two-day field trip, long to be remembered, Mr. and Mrs. Henry Mullner, in true photographers' style, took pictures of this novel event and again before the beautiful quarry.

Early Sunday afternoon, found the North Jersey Mineralogists homeward bound, tired but happy, for a fine spirit of sociability prevailed throughout the trip.

HISTORIC U.S. IRON MINE RE-OPENS

RINGWOOD, N. J.—An iron mine which is also credited as having produced the ore for the great chain General Washington placed across the Hudson to blockade the British in Revolutionary War days, on June 27, 1947, resumed operations here for the first time in 22 years to supply the nation's hungry steel furnaces.

Turned back to private operators by the War Assets Administration after being held in reserve by the federal government during World War II in case the Germans bombed the strategic ore-bearing Soo Canal of the Great Lakes system, the mine is loading cars with ore not mined since 1925.

The property is the historic Peters mine, one of the oldest in New Jersey where iron mining first was developed in America. It is part of the Peters and Cannon mines which were leased by the War Assets Administration to the private operators, Ringwood Mines, Inc., according to John E. Millea, Atlantic Zone Administrator for the WAA in New York City.

Ore from the Peters mine was made into links for the iron chain with which General Washington sought to keep the British fleet from ascending the Hudson to attack the American stronghold at West Point during the critical days of the Revolution.

Ore was last mined here in 1925. During the recent war, the government purchased and rehabilitated the mine as a reserve source of supply in case bombing should demolish the Soo locks and prevent the steady flow of Lake Superior Ore to the furnaces of the eastern industrial area.

Technical advances in the handling of the local ore, coupled with the increasing demand for steel and the steady lessening of the supply of the easily accessible surface ores in the Lake Superior region, make Jersey iron mining once more profitable.

Ringwood is a small village (borough) in northern Passaic County (northern New Jersey). The Peters is a magnetite mine and has produced a number of interesting minerals among which are augite, epidote, hornblende, magnetite, martite, stilbite, etc.

Among the magnetite mines which occur in Ringwood are the Blue, Cannon, Cooper, Hard, Hope, Keeler, Miller, Peters, and St. George. The Peters is by far the largest of them all.

NATIVE ARSENIC ONCE FOUND IN LOUISIANA

One of the few occurrences of native arsenic in the United States is the Winnfield Salt Dome of north central Louisiana. The mineral was found as spheroids ¼ inch in diameter in the anhydrite cap rock during the sinking of the mine shaft that was sunk by the Carey Salt Company. Its occurrence was described by Barnes[1] as follows:

"The native arsenic in the Winnfield specimens is a rather soft, brittle, light-gray, dull metallic mineral that tarnishes dark gray to nearly black, has a subconchoidal fracture, exhibits some evidence of colloform structure, and polishes to a white, smooth surface."

The Winnfield Salt Dome, located in Winn Parish, some 5 miles west of the town of Winnfield (more famous as the birth place of Huey P. Long), is being worked by the Carey Salt Company.

A letter from the Editor of *Rocks and Minerals* to the Carey Salt Company desiring information on whether or not native arsenic is still being found, brought a discouraging reply—the company never heard of arsenic being found in the area. This reply dated April 10, 1947, is here with reprinted in full.

"Your letter of April 2, 1947, addressed to this Company requesting specimens showing arsenic embedded in cap rock, has been referred to this Department for answer.

"We regret that we have no specimens such as you mention. The limestone, gypsum and anhydrite obtained when sinking the shaft were used as fill material and is now quite thoroughly covered with dirt and refuse. The few rocks still exposed fail to show such inclusions as mentioned. Years ago before this dumppile was covered, I have found a few specimens of anhydrite rock which contained some copper mineral also iron pyrite but nothing that looked like metallic arsenic. At the time of sinking the shaft not much attention was paid to inclusions. They were content to identify the formation as limestone, gypsum, or anhydrite."

M. C. Mann, Chemist,
Carey Salt Company

A second letter from Mr. Mann, dated May 19, 1947, gives the following information.

"We have only the one shaft, therefore, there is no special name to designate it. I am listing below a log of cores taken from L. D. C. No. 4 which was drilled on the location of the present shaft.

Louisiana Development Co. No. 4

From	*To*	*Thickness*	*Material*
0	56	56	Surface dirt, et.
56	119	63	Brown lime rock
119	260	141	Gypsum
260	280	20	Gypsum with streaks of sulphur
280	440	160	Anhydrite
440	910	470	Salt

Mining operations are on the 811 foot level.

"It is to be noted that the only unusual element noted in this log is the showing of streaks of free sulphur at 260 to 280 feet. This is typical of the logs of other core holes drilled. Some show pyrite but in none of them is there a mention or showing of either free arsenic or any of its minerals.

"There is a possiblity and even a strong probability that there was a showing (of arsenic) at some point in the cap rock, however, there is none in the salt as has been shown by subsequent analysis."

This is an instant where a few isolated crystals of native arsenic have been found by a mineralogist in the overlying cap rock (which has been discarded by the company as waste material), but many analyses of the salt, itself, fail to show even a trace of the element.

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[1]Metallic minerals in anhydrite cap rock, Winnfield Salt Dome, Louisiana, by Virgil E. Barnes, *American Mineralogist*, August, 1933, pp.335-340. Native arsenic is described on page 336.

A CHECK-UP ON LOCALITIES OF THE HAMMOND QUADRANGLE, N. Y.

BY KEITH R. DAHLBURG
862 Ostrom Ave., Syracuse 10, N. Y.

Most of the localities listed in Dana's "Descriptive Mineralogy," under St. Lawrence, Jefferson, and Lewis Counties, New York, occur in a belt about sixty miles long and thirty miles wide. This area, extending from Philadelphia to Potsdam, is underlain by pre-cambrian crystalline limestones and schists intruded by granites, diorites, and other igneous rocks. Although excellent specimens are still to be found here, many of Dana's localities are now exhausted, and a few new ones have been discovered.

In the last four years, two of my friends—Ambrose Smith and Edward Boyd, both of Syracuse—and I have made a number of trips in this region, particularly in the Hammond Quadrangle (the area between 45° 15" and 45° 30' N. Latitude, and 75° 30' and 75° 45' W. Longtitude; or roughly between Highways 11 and 37 from Antwerp to Richville). We have found Government Survey topographical maps, or N. Y. State Museum geological maps valuable since they show back roads, houses, etc.; and the town clerks have been very helpful in helping us locate old farms. The following notes are not complete, but they include most of the better-known localities of this area.

ANTWERP TOWNSHIP (Jefferson Co.)

(1) The Old Sterling Mine, 2¾ miles north of Antwerp village, was once famous for its capillary crystals of millerite; but though I have visited the mine twice, the only millerite found was a microscopic cluster. Excellent hematite is still found in abundance: red ocher, steel gray compact, botryoidal "kidney ore," and a few micaceous and crystal specimens. Pyrite, limonite, muscovite, calcite, quartz druses, and one specimen of a light green earthy mineral were found; and it is possible that other minerals may also still be found. My last visit was in 1945. The mine is abandoned and overgrown (it is 111 years old), and the pit is filled with water, but ore piles are still accessible. It may be reached from Route 11 by an obscure dirt road to the right, 2.1 miles north of the first road to Oxbow north of Antwerp village.

THERESA TOWNSHIP (Jefferson Co.)

(2) Although Dana places Muskalonge Lake in the town of Alexandria, it is actually in Theresa. It may be reached from the Oxbow-Rossie road by taking the dirt road to the west about two miles north of Oxbow, following it to the third road to the right, and following that to the Davis Camp. A century ago, excellent sea-green crystal groups of fluorite were found a few hundred feet north of the camp, but a thorough search of the area in 1946 revealed no trace of the mine. However, I obtained good massive fluorite of colorless to grass-green color from the cliff below the mine site. The deposit is about a yard in diameter in the cliff face, and may best be reached by boat. According to Mr. Joe Eggleson, a local inhabitant, large crystal groups have been obtained from a cave above the lake-shore locality. I believe they are all gone now.

I have been told that there is a copper mine (malachite?) a mile or so northeast of the lake. If true, this is an unusual occurrence, for there is little copper in this area except for small amounts of chalcopyrite.

ROSSIE TOWNSHIP (St. Lawrence Co.)

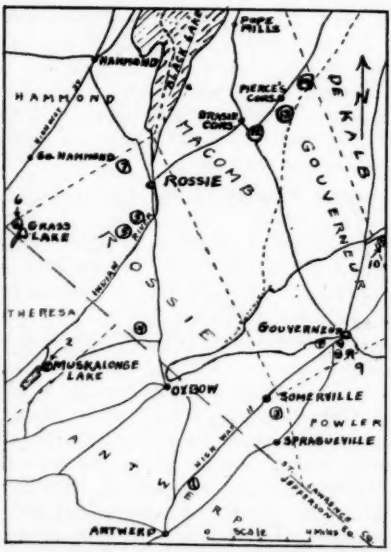
(3) Between Somerville and Spragueville are a number of iron mines which are a continuation of the belt including the Old Sterling. I have never visited them, but they should at least furnish hematite, if not other minerals as well.

(4) Two and one-half miles NNW of Oxbow, north of the road to Muskalonge Lake, there is an area about one mile square having disseminations and nodules of many minerals in crystalline limestone. A short search yielded phlogopite mica and a few sky-blue crystals of apatite. Diopside, missonite, wernerite, marialite, tremolite, chondrodite.

spinel, microperthite, orthoclase, albite, brown and black tourmaline, pyrrhotite, titanite, quartz, graphite, and serpentine also occur here, according to New York State Museum geologists. Though the locality is still as good as ever, a long search is necessary to find anything, since the minerals are scattered over such a wide area.

(5) The Rossie lead mines extend in an east-west belt 2½ miles long. If one turns west on the first road north of the Indian River on the Oxbow-Rossie road, one may see two old stone chimneys, one to the right and one farther on to the left, each marking the site of a mine. The others are a little harder to reach. The mines are abandoned and stripped of galena; however, some good cleavage calcite and a little chalcopyrite may still be found. (last visited in 1946)

(6) The old Abner Anable farm is on the northwest shore of Grass Lake. Though once a good locality for graphite crystals and later for apatite, I did not find the pits when I was there in 1945. Very probably, they are now covered up. I did find some phlogopite crystals and some rock loaded with flake graphite.



Sketch map of Hammond Quadrangle showing localities mentioned in article.

(7) About 1½ miles north of Rossie on the Rossie-Hammond road, ¼ mile southwest of where the road crosses Grass Creek, there is a locality still in excellent condition (1945). It is on a small cliff face of diorite which was once in contact with limestone, and is rather difficult to find because of the great number of small rocky hills in the vicinity. There is a unique landmark in the next hill towards the creek—a large smooth hole like a chimney, with an opening at the bottom as well. The cliff face is covered with crystals of apatite, pink calcite, and other minerals which I could not identify off hand, but which are said to be pyroxene, scapolite, feldspar, and titanite. It is difficult to detach the crystals from the rock without shattering them.

HAMMOND TOWNSHIP
(St. Lawrence Co.)

(8) The apatite and zircon locality on Mr. Hardy's farm near De Long's Mills has been lost. Though I have asked the town clerk and the tax collector of Hammond (1944) and several others, they all say that no one named Hardy ever lived near Hammond, and while one had heard of De Long's Mills, he couldn't remember where it was. It ought to be a good locality when found. Locality not noted on map).

GOUVERNEUR TOWNSHIP
(St. Lawrence Co.)

(9) There are several marble quarries near Gouverneur village which are said to have good apatite crystals and tourmaline. I visited the nearest one to the southwest edge of town (just off Route 11 to the south) in 1944 and found no apatite, but I did find some brown tourmaline and some of the finest biotite crystals I have ever seen. They are up to an inch thick and an inch and a half in diameter, the smaller ones being of the better quality.

(10) The Reese Farm near Richville has supplied many museums with brown tourmaline. Though the best crystals are gone now, tourmaline may still be found, together with good tremolite. (1944) By digging further, better specimens might possibly be obtained. The farm is reached from Gouverneur by taking the road to De Peyster, turning right on the

Richville-Rock Island road (just south of the Oswegatchie River) and going for about ½ or ¾ mile. The farm is now under a different name. The tourmaline is located in a cow-pasture south of the road: ten small pits were dug and have since been partially filled in.

MACOMB TOWNSHIP (St. Lawrence Co.)

(11) The locality of Mineral Point near Pope Mills is now uncertain, except that it was on the shore of Black Lake (possibly the lead mine 2¾ miles south of Pope Mills). (Locality not noted on map).

(12) On Route 58, 1.2 mi. south of Brasie Corners, there is a small hematite deposit. It is not a particularly noteworthy locality, though I did obtain some rough calcite crystals and a few small, beady crystals of metallic luster. (1944)

(13) The lead mines south of Macomb village (locally known as Pierce's Corners), some of which I visited in 1946, are totally exhausted—no galena specimens of worth, not even good calcite. I visited the two westernmost of the four.

(14) 1.8 miles northeast of Pierce's Corners were some pits which once produced good specimens of sunstone. A search of the site marked on the N. Y. Museum Survey map revealed no trace of the pits. (1946)

(15 A cave containing huge groups of green fluorite crystals was opened in Macomb many years ago. It has since been removed, and is on display at the State Museum in Albany. (Locality not noted on map).

Besides these localities, there are numerous scattered lead, hematite, and pyrite or pyrrhotite mines, disseminations of mica, graphite, spinel, groups of calcite crystals, etc. There are a great many contact faces and pegmatite dikes, and more localities in the rest of the belt. For reference I can recommend the following publications:

Dana, Edward Salisbury "Descriptive Mineralogy" 6th ed. pp 1062—1065 New York: John Wiley & Sons, 1909.

New York State Museum Bulletin No. 70 "List of New York Mineral Localities" by H. P. Whitlock

New York State Museum Bulletin No. 259* "Geology of the Gouverneur Quadrangle" (with map)

New York State Museum Bulletin No. 296* "Geology and Mineral Resources of the Hammond, Antwerp and Lowville Quadrangles" by A. F. Buddington (with maps)

Elwell, Wilbur, J., A mineralogical trip through northern New York. *Rocks and Minerals*, Feb. 1936, pp.20-21

Zodac, Peter, The editor goes afield. *Rocks and Minerals*, Jan. 1937, pp.3-14

Atkins, Frank P., Jr., A trip to Gouverneur, N. Y. *Rocks and Minerals*, Aug. 1939. pp.242-244

*May be had (if not exhausted) from the New York State Museum, State Education Bldg., Albany 1, N. Y.

Some Minerals of Wolfach, Germany

Wolfach is a little village in the Black Forest of southwestern Germany, at the confluence of the Wolfach and Kinzig Rivers in the eastern part of the state of Baden. Near this little village are a number of very old silver mines from which have come some interesting minerals.

Among the many minerals found in the silver mines near Wolfach are:

Argentite: A silver sulfide occurring in blackish lead-gray masses and crystals.

Dyscrasite: A silver antimonide, silver—white in color. Occurs as crystalline masses with argentite, barite, galena, proustite, silver and other minerals.

Erythrite: A hydrous cobalt arsenate occurring as peach-red incrustations.

Galena: Lead sulfide, dark gray in color.

Lollingite: An iron diarsenide occurring in silver-white masses.

Niccolite: Nickel arsenide occurring in copper-red masses.

Plagionite: Lead antimony sulfide of blackish lead-gray color and occurring in crystals and masses.

Polyargyrite: Silver antimony sulfide, iron black to blackish gray in color occurring in crystals associated with argentite, dolomite, etc.

Barite, calcite, dolomite, proustite, pyrargyrite, silver (native), and tetrahedrite are also found in the mines.

MINERAL COLLECTIONS IN COLORADO SPRINGS RANK HIGH IN WORLD IMPORTANCE

BY J. K. HALLIBURTON

Colorado Springs, Colorado

Mineral micro-mounts, as seen thru the microscope, bring one the jewel wealth of the Orient, the coral reefs of warm southern seas, the Painted Desert of Arizona, Carlsbad Caverns of New Mexico, the mathematician's models of geometric forms, a touch of Walt Disney, and to the abstract artist, a vast store of inspiration.

Your reporter has the honor and great privilege of knowing most of the local mineral collectors—and the embarrassing distinction of being the one mineralogically ignorant member of the Colorado Springs Mineralogical Society.

The number and quality of micro-mineral collections to be found in Colorado Springs rank next in importance only to those to be found in Philadelphia. Three micro-mount collections, entirely assembled by local men, rank with the best to be found anywhere. One of the three by some is placed second only to the Harvard collection which was assembled by George W. Fiss, Philadelphia business man. Others give it equal, or higher rating than the one in Cambridge. Still others would rate it in third position, below the C. S. Bement collection which is at present in the care of F. H. Keeley, curator of minerals at the Philadelphia Academy of Science. However placed in relation to these other two, it still is a collection of major importance, and to the serious collector, the value of such comparions are seriously questioned.

Assembled by Lazard Cahn

The collection referred to is that one which was originally assembled by Lazard Cahn, and which was recently bought by Mrs. Edward L. Kernochan and added to her own collection of over 600 fine specimens.

The second in local importance, and by some given fourth place in America, possibly world importance, is that of the local High school science teacher, Cecil H. Graves. Mr. Graves himself insists that the collection of Willet R. Willis, High school teacher of chemistry, who is being retired this year after 27 years with the local High school, is equally as good, and quite possibly better than his own. He points out, in support of his estimate of the Willis collection, that judgment cannot be based on numbers alone, that with the established collector elimination of less choice items is a means of improving a collection, and that Mr. Willis has been engaged in refining his collection by this means.

The true scientific attitude of local collectors is seen in their modesty concerning their own knowledge and the complete absence of brash statements regarding the field of their interest. Talk with any of them about their collection and you will be told all about minerals, the other fellow's collection, and Lazard Cahn.

Studied in Europe

Lazard Cahn, born in St. Joseph, Mo., May 23, 1865, got his early schooling in New York City, later studying in Stuttgart, Wurtemberg, under Dr. Victor Goldschmidt, the famous morphologist, at Heidelberg, and at various American universities. He held no academic degrees but his intimate knowledge of mineralogy made him the respected friend and consultant of scientists and collectors both in America and abroad. In 1928 he was vice-president of the Mineralogical Society of America, and a number of years later was offered the chair of Mineralogy at Nebraska University. He died in Colorado Springs, his home for many years, on the eve of his 76th birthday.

Cahn's knowledge was so obviously authoritative, his manner so inspirational, his heart so warm, that local people who knew him well, who had studied under him in the private class which he gathered about him to share his love of minerals, when these people were questioned as to what degrees this man held, they could not answer. Cahn's knowledge of min-

erals, his discrimination in their selection for scientific and display qualities, made measurement by mere college degrees inadequate.

Discovered 'C-Faces'

It was Cahn who made the discovery of quartz C-faces, and who first described the orientation of garnets on topaz. In the field of oriented intergrowths, he contributed to crystallographic knowledge by cataloging more than 70 combinations. The quartz C-faces were first found on Utah material. Willet Willis later found material bearing this same characteristic at Ruby Mountain, Nathrop, Colo.

Cahn, generous with his knowledge and enthusiasm, conducted a small class in mineralogy during the years 1932 to 1939. This privileged group, which met twice weekly, was composed of Mrs. Edward L. Kernochan, E. L. Timmons, M. D.; Cecil H. Graves; Willet R. Willis, Dr. S. Gross, physicist; Dr. Arthur Roe, chemist; William Davis, chemist and geologist; Dr. Frank Young; and Ralph Monell. Dr. Gross, who termed Cahn the greatest scientist and greatest man he had ever met, is now at Easton, Pa., with a firm which makes X-ray and electron microscopes, and the spectrometer which is used in the analysis of substances thru measurement of wave lengths of light produced when material is heated. Dr. Arthur Roe teaches chemistry at the University of North Carolina; William Davis is now in industrial work in Calfornia; Dr. Frank Young, son of Mr. and Mrs. J. H. Young, 412 East Williamette Street, who received his Masters degree at Colorado College and his doctorate at the University of California, Berkeley, is now with the western laboratory of the U. S. Department of Agriculture at Albany, California. Ralph Monell, formerly with Cheyenne Mountain school, is now Headmaster of the Iolani School, Honolulu, Hawaii.

City Had Large Collection

When this small group of enthusiasts were all in Colorado Springs, there were more crystal micro-mounts here than could be found in any other city in the world with the possible exception of Philadelphia. Cahn's own collection contained approximately 700 species, and 4,700 mounts. The hand specimen collection gathered by Cahn, and numbering 10,000 pieces, was sold to Northwestern University at Evanston, Ill.

The Cecil Graves collection of micromounts consists of 400 species and 4,200 mounts, the Willis collection numbers over 400 species and 2,000 carefully chosen mounts. Dr. W. L. Timmons, Colorado Springs physician, now owns the famous collection of 2,500 mounts which were assembled by the California mining man, Schernikow.

Crystal micro-mount collecting is a relatively new scientific hobby, having been started about 60 years ago in Philadelphia, and it is not unlikely that in Colorado Springs today there are more micromounts than would be found in all the countries of Europe.

When it is said that this or that person has a certain number of crystal specimens in micro-mounts it should be realized that this count is actually the number of boxes in which the crystals are mounted. An individual crystal is sometimes mounted in a box on top of a small cork stopper, between two small sheets of glass, on the head of a pin, or the eye end of a needle, but it is rarely that such single crystals are mounted. Usually the crystal in which the collector is interested is imbedded in the martix, or is in a hollow in the matrix, and is surrounded by thousands upon thousands of other crystals which are less perfect in shape or color. The micro-crystal collector actually has millions of crystals in his collection.

Crystals Hard to Get

In preparing a micro-mount, the hobbyist will crush pounds of material at times to obtain a specimen which will weigh but a gram or two, sometimes a mere fraction of a grain. The most powerful microscope objective with highest power eye piece generally used in viewing specimens gives an enlargement of 175 diameters. Anything stronger than this is not generally used because the objective would have to be so close to the specimen that there would be danger of crushing it in focusing the instrument. With the 175 diameter enlargement some

specimens are so minute that they can barely be seen.

The standard micro-mount box is 1 inch long, by ¾ inch wide, by ½ inch deep and costs, at this time about 5 cents each. It is interesting to realize that the 4,200 boxes of Cecil Graves cost him more than his two microscopes. Graves stores his micro-mounts in wooden boxes which measures 5 inches by 5 inches by 8 inches. Each of these boxes holds 180 mount boxes, and he has 24 of these larger boxes filled.

In the field of hand specimens—specimens of large size which are examined without optical aids—Colorado Springs has quite a number of outstanding collections, all gathered by amateurs. The outstanding half-dozen are those of O. A. Reese, tailor; George White, accountant; Willard Wulff, business man; Perry Osborn, cabinet maker; Tim Anglund, owner of a meat market; and Bob Chadbourne, mail carrier.

The collection of Reese is of such importance that Cecil Graves terms it: "The best strictly amateur collection in the region, and one of the very best in either amateur or professional classification." Graves further states: "I consider Mr. Reese the best crystallographer in Colorado Springs. I think that for a man who started from scratch and on his own he has done an unusual thing." Mr. Reese has had no formal scientific training, yet his standing as a mineralogist determined his selection by the United State Government to do prospecting in Mexico for optical calcite during the war years.

The well known artist, Otis Dozier, who was briefly with the local Art Center, has declared that from the standpoint of beauty the Reese collection is far superior to the leading collections in the East.

The professional collector, prospector, and dealer, Edwin Over, of West Cucharras street, and Lazard Cahn are the two Colorado Springs men who have had the honor of having minerals named for them. Prof. Charles Palache, of Harvard University, named the Overite and the Cahnite in honor of these men. Many hand specimens in the Harvard University collection have been bought of Ed Over.

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SOME TROUBLES OF A ROCK HOUND

By SAMUEL C. BROWN
Stamford, Conn.

Some people seem to think that the hobby of rock and mineral collecting is done only by weak minded persons or in other words, "nuts".

For example; the writer and another rock hound was looking over a rock pile aside of the road near a sanatarium, for garnets, when along came a car driven slowly by a couple of benevolent elderly ladies. One of the ladies remarked, as she looked at the rock hounds," Poor fellows, they must think that there is gold in those rocks."

While on a tour through Yellowstone National Park, the writer expected to procure at least one specimen of obsidian from the famous Obsidian Cliff, but alas, the driver of the car stepped on the gas and passed over the road at 60 miles an hour remarking that any one must be crazy to stop on the road for a rock.

While exploring the famous feldspar quarry at Branchville, Conn., the writer and another R. H. passed through a chicken yard to the consternation of the inmates, and the owner insinuated that we were after his poultry and threatened to have the law on us.

While visiting the Crystal Cave in Bermuda, the writer stooped to pick up some loose change he had dropped and was accused by the guard of picking up a small stalactite.

Some years ago while returning from the Bedford, N. Y., feldspar quarries (on a bike), the bag of specimens that the writer had tied on the handlebars became untied and rocks were scattered on the road. As he was picking them up some passerby remarked, "Look at the nut".

In closing would remark that very few persons who have hobbies of some kind are weak minded, while the man or woman that does not have something to occupy his or her mind is generally unsettled in mind and body.

PATTERSON ILLUSTRATES CRYSTAL SYMMETRY WITH WALLPAPER

By CHARLES A. BELZ,
Secretary, Philadelphia Mineralogical Society

The announced title of the address to the Philadelphia Mineralogical Society for the April 3, 1947 meeting was given as "Wallpaper—and Other Minerals", by Professor A. L. Patterson, of the Department of Physics, Bryn Mawr College. A serious minded devotee of the earth sciences might wonder at such an incongruous combination of ideas,—might be inclined to some speculation as to whether the good professor could possibly be a victim of that particular form of cerebral fission of which many generations of professors have been accused. The platform presence of Professor Patterson however immediately dispels any notion that he has succumbed to any such vocational malady. His choice of subject, the internal structure of crystals is admittedly a difficult one, but to the extent that it is possible even partially to clarify this exceedingly complex branch of the study of minerals in one short evening, our speaker by his liberal use of example, slides, and scale models, achieved that result in good measure.

Professor Patterson led the way through a gigantic rabbit burrow into the wonderland of inter-atomic space by an imaginary start at the rim of the Grand Canyon, and from this vantage point marvelled generally at this magnificent example of Nature's plodding work. But more specific than this general admiration, a geologist part way down the canyon wall studiously reads the story of the rocks. At the very bottom, a mineralogist chips off fragments of rock to examine their mineral structure. Now undertaking one of those fanciful subversions of space and dimension, carry the mineralogist and his position 100,000,000 times above the rim of the canyon, and leaving him there to hold his end of this fantastic surveyor's tape, return to the bottom of the canyon, and there begin the study of the internal structure of a crystal. We may here observe the interior decorative treatment given these infinitesimal ingredients of all matter and substance, note the arrangement of molecules and atoms, see the crystal lattice, look at—the Wallpaper.

To comprehend what we might see in this strange world far beyond the limits of the most powerful microscope, where only the brazen eye of the mind can stare, Professor Patterson reviewed our mundane knowledge of crystals. The early growth of that knowledge since the time when crystals were considered merely as some mysterious exception to the more common forms of solids, was slow. Not until the end of the 16th century did the invention of the microscope reveal the fact that crystal form was *not* a rarity in nature, but that practically all minerals in microscopic size showed evidence of crystal form. By the end of the 18th century, knowledge had progressed to the stage where it was concluded that crystals were not merely solids bounded at random by smooth flat faces, but that there was an order, and a regularity to the occurrence of these faces that followed some definite design. The interfacial angles were constant for the same material,—the ratios of intercepts were always simple whole numbers. With the publication of Hauy's essay in which crystals were classified as to form, the Science of Crystallography was born.

As a result of careful measurement and mathematical deduction, all crystals were found to belong to one of six great groups or systems, depending on the relative lengths of the axes, and their inclination to each other. The repetition of faces, edges, and vertices of crystals in a regular and orderly fashion, and presumably in accordance with some fixed law, is called symmetry, and with the limitation imposed by the rationality of intercepts, it was found that only 31 combinations of the elements of symmetry were possible in crystals,—adding one division for those devoid of symmetry there are thus 32 crystal classes.

By the middle of the 19th century, attention was being focused from the outward forms to the internal structure of crystals. Toward the end of that century, the work of such investigators as Bravais, Schoenflies, Federov and Barlow not only succeeded in defining all the possible symmetrical arrangements of points in space, but also to represent by lattice-like arrangements the positions of the molecules in conformity with that symmetry, and at the same time account for the external form of crystals. But there was no way of obtaining experimental evidence of such conclusions because molecules and atoms are so small that the most powerful microscope could not disclose them. At last in 1912, a method for proving this theory was available when Laue and his associates demonstrated the fact that X-rays, because of their short wave length, could be reflected from the atomic planes of a crystal. The subsequent calculations which determined the distances between these planes, and angles between intersecting planes, definitely fixed the position of atoms, and verified their locations on lattice-like structures as had been deduced by theory.

Since the development of modern X-ray analysis, tremendous advances have been made in our knowledge of crystal structure, and thousands of different substances have been studied. The true scientist is not interested merely in accumulating data, but rather from these data to find the "why" and the "wherefore" of things, to interpret what he finds to be factual, to unravel a tangled skein of evidence, and weave instead a logical design that will rationalize the pattern of things known, and perhaps point a way to penetration of the mysteries of the unknown. Science now attempts to discover the relations between the crystal lattice, (the known arrangements of atoms in a crystal) and the known chemical and physical properties of the material crystallized. Each laborious step in this quest is planted on the concept of the crystal lattice. It is the contemplation of this framework that formed the subject matter of Professor Patterson's address.

To observe them closely, we project ourselves into inter-atomic space—to the eerie, supercharged atmosphere of protons, and neutrons, and dizzily whirling electrons. We stand and gaze in awe down a long vista of glowing suns, and moons, and galaxies of stars, revealed in an endless and repetitious regularity to vanish at last in the frightening distances of micro-cosmic space. We look to the right, and to the left, and see, perhaps a different pattern, but nevertheless the same monotonous repetition. We stroll along an atomic plane, and everywhere find the same deadly regularity of design in the same direction. Soon we are lost, for everywhere we stand, the views are exactly the same. We journey to other crystals, and always find though patterns may change, the same uniformity, the same unending and constant repetition. We may feel that perhaps our senses may deceive us, but our reason tells us that it must be so, or crystals could not exist as we know that they do.

Professor Patterson illustrates this homogeneity by the simple example of a picket fence across the prairie. No matter where throughout the length of this fence we stand, the fence looks exactly the same. There are no pickets missing and we could not orient ourselves.

While this characteristic of homogeneity is essential to all crystal form, and consonant with chemistry's law of constant proportion, nevertheless, for crystals of different substances, the patterns of arrangment, the geometrical unit design itself, varies. After having observed and been able to recognize the thematic arrangement of some of these compositions, the question naturally arises, "just how many different arrangements of unit points can possibly be made, and still maintain the requisite uniformity and regularity?" We begin with the flat world of paper dolls, with all our cut-outs geometrical figures having straight edges such as triangles, squares, rectangles, rhombs, rhomboids, or hexagons. No matter how we try to place together these units to make up simple patterns, we find that we

cannot do this in more than 17 different ways. Upon examination of our work we find that we have achieved some patterns without symmetry, some with a center of symmetry and other patterns with plane or mirror symmetry, and still others with combinations of different elements of symmetry. The fact that wallpaper is printed from rolls carrying a basic design which with every revolution provides the necessary regular repetition, makes this an excellent material for illustrative purposes. Professor Patterson exhibited numerous examples of wallpaper and linoleum designs, and pointed out the features of unit structure and symmetry. He showed slides of Egyptian and Grecian patterns of ornamentation, and though actual details differed there was great similarity in degrees of symmetry. While Egyptian designs revealing their employment of all 17 types have been found, the actual theory of groups was not enunciated until the last century. Our speaker defined this theory of groups as the "systematic method of trying to arrange arbitrary units to make a simple pattern".

Since crystals are solids, not planes, it is necessary to expand the planar theory of groups to a third dimension in order to study crystal structure. Plane geometric units become simple geometric solids, and the problem is to find the possible arrangements of these figures to account for the 32 symmetry classes of crystals as mathematically deduced. Schoenflies, Federov and Barlow independently and almost simultaneously between 1890 and 1894 completed their studies of these point systems and determined that there are in all 230 possible types of homogenous structure. The simplest arrangement, and most familiar one is the close cubic packing referred to as "cannon balls on the court house lawn" type. In addition to the simple lattices defined by considering the molecules or groups of molecules as points, other networks can be formulated by considering the atoms themselves as points of repetition. By assuming movements of translation, rotation, interpenetration, reflection, and combinations of these, all the necessary net-works can be formulated to account for all of the 32 possible classes of symmetry. As might be expected these 3 dimensional space groups can be extremely complex and even with the aid of scale models recognition of the pattern is not too easy.

Professor Patterson's address could hardly fail to stimulate interest in any repetitive design. There is probably nothing in which we have been less interested than the designs of wallpaper. However, the idea of seeing in them a concrete even if unintentional application of the theory of space groups, opens new sources of distractions. We are daily confronted with such designs, and each will present a challenge to be met. Is there symmetry —and to what degree? What is the unit cell? Where the center—where the plane? Project the pattern along an axis, and manufacture a crystal—what is the system? This past-time might seem difficult at first, but with practice, the intricate designs *might* become clear, and our understanding of space lattices other than the simple cubic, actually clarified.

Appointment to Illinois Geological Survey

Dr. Arthur C. Bevan, State Geologist of Virginia, Charlettesville, will transfer on September 15 to an important post on the Illinois Geological Survey, Urbana, as Principal Geologist in charge of the Geological Resources Section, succeeding Dr. Ralph E. Grim who has requested relief from administrative duties to devote more time to the Survey's research program on clay minerals.

The Geological Resources Section of the Illinois Survey comprises nine divisions—Coal, Oil and Gas, Industrial Minerals, Clay Resources and Clay Mineral Technology, Groundwater Geology and Geophysical Exploration, Engineering Geology and Topographic Mapping, Areal Geology and Paleontology, Subsurface Geology, and Mineral Resource Records—and numbers approximately fifty scientists and technical people.

The Survey's research program as planned and carried out by the Geological Resources Section, the Geochemical Section, and the Mineral Economics Section will be coordinated by the three section heads, Dr. Bevan, Dr. F. H. Reed, Chief Chemist, and Dr. W. H. Veskuil, Mineral Economist, with the advice of the Chief of the Survey, Dr. M. M. Leighton.

Dr. Bevan will retain his Chairmanship of the Division of Geology and Geography of the National Research Council.

MY OREGON COLLECTING EXPERIENCE

By ED. DUSERIK
12 Greenbrier St., Dorchester 24, Mass.

While on a motor tour of northern Oregon during the month of July, 1946, I chanced to discover some fine specimens of petrified wood, red jasper, thundereggs, and agate-filled nodules. The country thereabouts is made up of gulches and canyons due mainly to soil erosion; very few trees are to be found in the section where I hunted for minerals.

As it happened, I turned off of the Sherman Highway, ¼ mile south from Grass Valley, in western Sherman County, and drove along a rather bumpy road for ¾ of a mile. Some of the land bordering or skirting the road was fenced in, which, I presumed, belonged to neighboring ranches which were few and far between. However, I don't recall seeing anything of civilization after leaving Grass Valley but I did notice signs of mineralization where the road started to dip or slope towards the Deschutes River Canyon below.

I stopped the car once or twice, got out, and with my mineral hammer chipped off a few segments of white and pink calcite and as luck would have it found some excellent specimens of moss agate not very far off the road. The road in this section was very narrow, just enough room for one car to make it comfortably. As I remember it distinctly, to the left of the road (where the shoulder supports this narrow strip of descent), one could look 800 or more feet down into the canyon. And, as I also found out during the next day, this canyon also sloped in a gradual way to meet or intersect the floor of the canyon by the Deschutes River, I decided at the time, after I located the calcite and moss agate, to descend to the floor of the canyon, by the river. I have been told since that the salmon work their way up this swift river and its rapids—against the current all the way from the Columbia River—for spawning. At the time, however, I was more interested in finding minerals than in the fine art of fishing.

After parking the car, I decided to walk up the road which I had just descended. Directly above this road there is a high tableland, probably 200 feet high, which I decided to climb. After much scrambling and stumbling here and there, inspecting this and discarding that, I finally reached the summit of the mesa or tableland. Having a tendency towards excess avoirdupois and between exertions resembling a freight train's whistle, I was more than delighted with the pause that refreshes. There wasn't much to see on the top of the tableland—just sage brush and an occasional cottontail who was curious to know what this two-legged individual was up to. Not a foolish cottontail, however, as he kept a safe distance away.

At the time, however, I could not have resembled a human being as I was on my hands and knees most of the time and inspecting every rock available with my hand lens. When I reached a large outcrop I chipped off a fair-sized sample on which I affixed an adhesive label bearing a number for identification purposes later. I was more than delighted with this discovery of mine for said rock turned out to be an excellent petrified wood in the form of a tree stump. The bark of the petrified wood was very clearly defined. It was a pleasure to add this very fine specimen of silicified wood to my collection.

After this find I sat down to rest and looking over the contents of my collecting bag, accumulated during the arduous journey up the slope, I found calcite, chromite, jasper, opalized wood, pyrite, sillimanite, and a small nodule impregnated with uranium, plus a large Indian arrowhead.

The sun was beginning to descend in the west and the canyon walls were turning purple which reminded me that the close of day was near and that another day was in the making. My vacation period, too, was about over and the long trek home was before me. But all in all I enjoyed the experience very much—even the puffing and scrambling up the steep slope.

COLLECTING MINERALS IN 1847

Editor's Note: The following notes, descriptive of a two day mineral trip to some lead mines of Cumberland, England, in 1847, appear in Henry Sowerby's *"Popular Mineralogy,"* London, 1850, pp.14-23. The trip had been written up so interestingly that we feel our readers would enjoy reading about it and for this reason it is reprinted.

The following account of a short journey amongst the Cumberland mountains, in search of minerals, was kindly furnished us by Mr. B. Wright, of Liverpool, who has for many years been in the habit of personally collecting the mineral productions of these mountains, and through whose exertions many rare and beautiful minerals have been introduced into the cabinets of amateur collectors, which otherwise would probably have rested for ages in their dark security, unknown to the eye of science. On this occasion Mr. Wright acted in the capacity of guide to a gentleman well known in the mineralogical world, who, not content with the mere possession of a most splendid collection of minerals, was prompted by his enterprising mind to seek them in their native fastnesses amongst the mountainous scenery of Cumberland. As far as practicable, we shall relate the particulars of the journey in the words of Mr. Wright:—

"In the summer of 1847, a Mr. C., being desirous of visiting the localities of some of the rare Cumberland minerals and personally inspecting the mines, made arrangements with me to accompany him as guide. This, I must observe, is absolutely necessary to a stranger visiting this distict, for, though solitude is, perhaps, preferable, if the object be merely to admire the splendid scenery of the place, a stranger in search of minerals might walk and search about for a very long time, and completely tire himself out, and would probably return as wise as he started as to the precise spots where minerals worth having were to be obtained, or the roads leading to those spots. A few days afterwards Mr. C. arrived at Liverpool, whence we took the rail to Penrith, at which place we hired a vehicle, and fairly started on our journey, Mr. C. promising himself a rich harvest as its result. Before we had reached half-way towards our destination, the night had far advanced, and the silence was unbroken, except by the hooting of the wood-owl and the flapping of wings of the water-fowl, which inhabited the numerous lakes and pieces of water that we passed on our road. Taking our route by the River Caldew, and turning to the left, we came in sight of a small but compact village, called Hesket Newmarket. When we reached it, the hour was so late, that all of its inhabitants had retired to rest, and were buried in deep repose; not a voice was to be heard, nor the twinkling of a light to be seen. However, we had previously settled to remain at this village for the night, and now found that our long drive, and the cold winds that we had encountered, had not disposed us to alter our determination. Pulling up, therefore, at the first inn we came to and knocking lustily at the door, the landlord soon made his appearance; and after his first drowsiness had worn off, we found him to be a very cheerful entertainer. Not less welcome was the supper he provided; and if Mr. C. had felt somewhat dispirited at the commencement of his trip, his meal, and the few hours of sleep of which he afterwards partook, under this hospitable roof served to renew his ardour and to recruit his strength.

"Early next morning we proceeded on our journey to the mountains on foot, as horses or vehicles would have been of no service to us here. After walking some distance over hills and dales, we sat down to rest; and now beheld a phenomenon, ordinary enough in itself, but which is seen among these beautiful mountains to the greatest advantage: I allude to the rising of the sun. Having watched it as it seemed gradually to emerge from the German Ocean, and then burst upon our sight in all its brightness and gorgeous hue, we resumed our way, and after toiling on for five or six miles, halted at the first mine.

"The entrances to the mines are much like doorways, four feet wide and seven feet high, rounded off at the top; the mine generally runs into the side of the mountain on a level, and these passages

extend to very great distances. All the metal is drawn out on a railway, and all the operations of crushing, grating, washing, and smelting the ore are carried on outside. We did not, however, enter this mine, as there were others in which we expected to be more successful, but contented ourselves with examining what the miners had brought out, amongst which we found several interesting minerals, and even some which were unknown to us. This success gave Mr. C. renewed courage to proceed on his enterprise, which now, indeed, became necessary, as our difficulties and dangers increased. We now reached a very narrow footpath, which led us over stupendous and dangerous precipices. This footpath was made expressly for the miners to bring out the ore on the backs of asses and small ponies. I have seen as many as twenty or thirty, one after another in a line, as it is not possible for two to go abreast, the width of the path never exceeding two feet. Having proceeded along this path some distance, we at length arrived at the mine called Roughtengill, which is well known to have been formerly worked by the Romans, whose mode of working differed from the modern, for they used to heat the rock, and then throw water upon it, which would burst it in many directions. I knew that we should most probably meet with some good things in this mine, and we therefore concluded to examine its interior, and, having prepared our lights to guide us whilst penetrating its depths, proceeded onwards. We found the sides and roof of the passage very jagged and rugged, as is often the case, but I cannot say that the lights of our candles were reflected back by a thousand crystals or stalactites, which Mr. C. had evidently expected; on the contrary, the surfaces around us had a very dirty and dull appearance, and the path was so deep in mud, that we had some difficulty in making our way. In order to enliven his spirits, Mr. C. commenced whistling which, to my regret, I was compelled to check as the miners are very superstitious respecting the practice of whistling in the mines, considering it a forerunner of some great evil.

"Before we had proceeded very far, our progress was entirely stopped by the falling-in of a portion of the roof, but, by dint of great exertion, we removed the soil, and rendered it passable. Having now travelled some two hundred and forty fathoms underground, our toil was in some degree repaid by the discovery of the first touching of the mineral vein, and Mr. C. at length had the satisfaction of seeing some fine crystallized *Arseniate of Lead* in its native place, adhering to the roof of the mine. Observing this, we went eagerly to work, and procured some capital specimens, though our great object was to obtain those rare minerals, *Brochantite*, *Cupreous Sulphate of Lead*, and *Caledonite*.

"Wending our way a further distance of a hundred and sixty fathoms, another difficulty presented itself, that was not quite so surmountable; the sides of the mine had given way, and entirely stopped the water from running in its natural course. We, therefore, began to clear away portions of the wood, stone, and soil, which arrested our progress. Mr. C., though I doubt if he had ever handled a pick before, working away with the greatest good humour and with such effect that we hoped our united exertions would in another minute have enabled us to proceed; but, in this, we were doomed to disappointment.

"The clearing away of rubbish only gave vent to a large quantity of water that had accumulated behind it, and the obstacle being removed, out rushed the water with the greatest force, carrying everything before it. The suddenness of the outburst was such that I had the greatest difficulty to retain my footing, but, having somewhat recovered my surprise, I remembered Mr. C., looking round, I observed that gentlemen standing in water at least two feet deep, and in a perfect bewilderment of amaze, as his situation was not only exceedingly unpleasant but entirely unexpected. Though my own position was anything but agreeable, I could not forbear laughing at the ridiculous figure both of us presented but Mr. C. only replied by his reproach-

ful looks. I then went on personally to the depth of four feet, but finding the water increasing in depth, and that it was impracticable to proceed further in our investigations, I returned and found Mr. C. standing in the same spot, and in the same attitude of astonishment. We then made the best of our way out, and retraced our steps, the evening having far advanced before we reached the village and our worthy landlord.

"The inconveniences to which Mr. C. had been subjected had not, however, damped his ardour. We, therefore, after partaking of a bountiful breakfast started again, at an early hour, to renew our search. Taking a different route, we proceeded by Wood Hall, and, passing the park, took a westerly direction towards the mountains. We soon arrived at an extensively worked mine, called Sandbed; but here we found nothing of importance, except some good *Sulphuret of Zinc,* this being the only locality for that mineral in Caldbeck Fells. Our plan was now to visit Drigga, an ancient mine which had been worked for four centuries, as there we expected to reap a goodly harvest. My companion found that climbing the very steep sides of the mountains was a most fatiguing operation, and several times did we stop on our way, as much to admire the beautiful view around us, as for the purpose of rest or refreshment. From the height we had attained, the view was most extensive, comprising mountains, hills, valleys, moors, and plains, and even from one spot we gazed down upon the very pretty village in which I was born.

"At last we arrived at Drigga, but here again were disappointed, for every bit of stone had been ground down to extract the ore from it. On we went, until we reached a small, but interesting mine, called Drygill, which lay between two stupendously high mountains. In our course hither, we had to pass over the edges of some dangerous rocks, and of course, as guide, I led the way, when my progress was arrested by hearing a lusty shout for help I quickly turned round (though this was attended with some danger), and beheld poor Mr. C., who had lost his footing on our narrow path, sliding down towards the edge of a fearful precipice. A moment later, and he would have been beyond the reach of human aid, but, fortunately, my extended hand was in time to save him from his peril. Thence advancing along a narrow path, we came to the place where the miners were at work. Their dress consists of a flannel shirt and trousers, and wooden clogs well clamped with iron; on their heads they wear a red or blue worsted night cap, presenting a rather uncough appearance. Notwithstanding their appearance and roughness of manner, the liberal douceur with which Mr. C. presented them had the desired effect, and they displayed great kindness in showing us the most interesting parts of the mine, and the operations connected with it. We then examined a portion of the vein which breaks out to the light of day, and discovered some excellent specimens of *Arsenio-phosphate of Lead,* in very fine and perfect crystals. This mine, and those in its vicinity, are, without doubt, the most productive in the mineral district of Cumberland, no less than thirty different substances being found in that locality.

"Descending then to the village with our spoils, which were not very weighty, we passed the night in rest, and early next morning Mr. C. departed for the metropolis, highly delighted with his two days' tour."

Minerals of Kailua, Hawaii

Kailua is a small seaport on the southeastern coast of the island of Oahu, Hawaii. In the swamplands surrounding the town, very nice loose colorless crystals of selenite (gypsum) are found.

In the basalt cliffs of the town, some very interesting quartz minerals occur. Chalcedony, the native "moonstone", is found in white rounded masses which are often encrusted by drusy quartz. Good masses of red jasper furnishes an interesting gem stone. Rock crystals, the famous "Hawaiian diamonds" are fairly common as small crystals associated with the chalcedony.

REMINISCING ON COLLINS HILL, PORTLAND, CONN.

BY DAVID M. SEAMAN

Carnegie Museum, Pittsburgh, Pa.

It has been the writer's privilege to have made six collecting trips from 1932 to March 14, 1947, to the Collins Hill, Portland, Connecticut, locality. On each occasion except the last some excellent specimens were obtained and if the writer had been prepared to dig into the dumps any distance he is sure that some fine minerals could have been secured. Today with so many mineral clubs having held their outings there, little good material save excellent micromounts can be collected without digging deep holes into the dumps. The quarry was in operation on all trips made save the last when it was seen to be in a state of abandonment with the pit filled with much water. This famous locality during the period of its operation has yielded some sixty different minerals and their varieties. The locality was fully described by the editor in the May, 1937, issue of this magazine.

At the time of my first trip there in June, 1932, some wonderful mineral specimens were available. The dumps were a mass of large blocks of pegmatite filled with tourmalines of various colors. Large, perfectly formed, black tourmalines many with good terminations could be picked up without much effort. Green and bluish tourmalines were much in evidence on the first dump met with as one climbs the road to the quarry. Granular, massive lepidolite was very common. Much blue beryl could be obtained at that time from this dump. There was a pile of broken blue and yellow beryls near one of the buildings. Many of these crystals were terminated with a flat base an one end and tapered to a point on the other end. A few fair blue beryls are still available in very large blocks of pegmatite on this old dump were one to break them up with explosives. Very little beryl was seen on March 14, 1947, and it was of very poor quality. One of the finds on that first visit was a part of a half inch crystal of purple apatite in a small vug in albite and quartz. A small one quarter-inch long true gem kunzite crystal was also obtained from another small vug.

The opening up of the Schoonmaker mine occurred in July, 1933, and some truly fine tourmalines could be collected from the first material thrown out from near the surface. Tourmalines in five colors were easily collected ranging from green through yellow to purple, blue, and black either from one end of a crystal to the other end or perhaps in a series of different colored crystals in parallel position with each other. Much of this material was quickly covered up so I feel that if one could get into the center of this dump some fine tourmalines could still be found.

On November 11, 1934, in company with the editor of this magazine, the locality was visited again. Many excellent minerals were available. Lepidolite was still quite common as well as large, lath shaped, portions of spodumene crystals cutting blue cleavelandite, many crystals coming together at a point in a V-termination. One such specimen had a perfectly terminated spodumene cry tal attached to it, about an inch long. A small one-half inch long bicolored pink and green tourmaline crystal with pink interior and outer edge green, like a watermelon, was picked up from the dump of the Schoonmaker mine. A small perfectly terminated manganapatite crystal with black tourmaline and almandite garnets and yellow beryl as associated minerals was secured.

On the May 6, 1939, trip a small part of a beryl crystal of cutting quality aquamarine was found on the largest of the Strickland dumps. At that time some excellent green tourmalines were obtained a few of which had perfect terminations. These were in large blocks of pegmatite about two or three feet square. One small one-quarter times one-half inch section of a gem indicolite tourmaline was also found as well as pink beryl crystal

sections, and small pyrite and purple fluorite crystals.

A few good minerals were collected again August 25, 1941, as rock crystals, pink beryl crystal sections, colored tourmalines, etc. but only a couple of tourmaline sections of bicolored lengthwise pink and green were found on the latest trip on March 14, 1947, on the newest of the Strickland dumps.

An industrious collector should still be able to find many good minerals by digging into the dumps some distance. This sporadic collecting of the writer is no indication of what good minerals have been found at Collins Hill and no doubt the active New England collectors who have been here in one season as many or more times than the writer has in fifteen years have found much better material than he did. Let's hear from them about their experiences at this grand locality. I believe that Collins Hill is still a much worthwhile locality. Let us not completely abandon it for a while longer but let us dig a little deeper and perhaps we may be rewarded for our additional efforts.

TILLY FOSTER, N. Y., STILL AN ACTIVE LOCALITY.

By THEODORE FREDERICKS
473 Harmon St., Brooklyn, N. Y.

You have often been told that a certain locality (here or there) was not worth a visit. As for myself, I do not take too much stock in these reports until I and another collector jointly visit such a locality. Once there we split up and scout the dumps, ledges, or likely looking boulders be broken up. We then get to work collecting specimens and verifying each other finds.

This is a report on the findings at the old abandoned Tilly Foster iron mine near Brewster, N. Y., made last August by Mr. Adolf Koerber and myself. We are both members of the Queens Mineral Society and the Rocks and Minerals Association.

We are of the opinion that this locality is far from dead, even though it has been abandoned and its dumps have been picked over for the last 50 or 60 years.

The following is a list of minerals collected and those that were noted while we were scouting:

Minerals Noted

Albite
Biotite
Calcite
Epidote
Fluorite
Pyroxene
Quartz
Tremolite xls

Minerals Collected

Actinolite xls
Brucite
Chondrodite xls in calcite
Chondrodite xls in pyrrhotite
Clinochlore
Enstatite (bronzite)
Magnetite xls in calcite
Pyroxene
Pyrrhotite
Serpentine pseudomorphs after hornblende.

New Finds

Scheelite
Siderite
Serpentine pseudomorph after pectolite

The serpentine pseudomorph after pectolite and the scheelite were turned over to Mr. John N. Trainer, of New York City, for inspection, who verified them as two good finds. He told me that he, too, had collected the serpentine after pectolite at a previous date but was not sure of its identity. The two specimens were returned to my collection.

As far as is known, the scheelite specimen from this locality is the only one known.

Hurrah! Rockhounds Agree on Something!

Editor R & M:

Every chap I recommend your magazine to is, as I am, thoroughly agreed *Rocks and Minerals* is just about the greatest publication on the market. It has so much for so little and appeals to layman and advanced student alike.

Floyd Faux,
Bethlehem, Penn.

June 24, 1947.

PLAGIOCLASES. HOW COME?

BY W. HAROLD TOMLINSON, Springfield, Penn.

It is not the purpose of this article to add anything to our knowledge of the plagioclases but rather to arrange systematically the data we have. The plagioclase group is probably the most abundant and widely distributed group of rock forming minerals. Different members of the group are found as primary minerals in all classes of igneous rocks. In spite of their abundance we seldom find them adequately represented in mineral collections. This is probably because nice specimens are seldom found and one hesitates to crowd one's collection with mediocre specimens altho they may be representative.

The plagioclase group is composed of two end members in isomorphous mixture. When pure, these end members are formed under very different conditions. Anorthite, the lime plagioclase, crystallizes from basic igneous magmas at a high temperature. It can be made in crystal form, synthetically, from a dry melt of the right composition but cannot be made from water solutions. Albite, the soda plagioclase, on the other hand, is formed at low temperature from aqueous magma or water solution and cannot be made in crystal form from a dry fusion. One would hardly expect minerals that develop under such different conditions to form an isomorphous series, yet these two minerals crystallize together in all proportions to form the plagioclase group.

If we arrange our plagioclase specimens in order from anorthite to albite and note the kind of rock in which each occurs, we will find (assuming that our specimens are primary plagioclase which has crystallized directly from an igneous magma), that we have arranged the rocks systematically according to the usual classifications of igneous rocks. It is an interesting analogy.

There are several classifications of igneous rocks but the main groups are usually based on the percentage of silica found in them by the chemist. These main groups are basic, intermediate and acid. To these we might add pegmatites and veins altho these groups are really differentiates from a parent magma. If instead of taking the percentage of silica for a basis of classification, we should use for our basis, the temperature at which the magmas are supposed to solidify, from high to low, we would get exactly the same grouping. If we should make our classification according to the amount of water or volatile matter the magmas are supposed to contain, again we would

TABLE

Classification of igneous rocks.	Rock types.	Basis % silica.	Basis Solidification temperature	Basis % water	Plagioclase contained.
Basic	Basalts Gabbros Diabases	50%	900C	4%	Anorthite (rare) Bytownite Labradorite
Intermediate	Andesite Diorite	60%	700C	6%	Sodic labradorite Andesine Calcic Oligoclase
Acid	Porphyries Granodiorites Monzonites Granites	70%	500C	10%	Sodic oligoclase
Pegmatites	Pegmatites	80%	250C	20%	Sodic oligoclase Albite
Veins			200C	very high	Albite.

get the same arrangement.

This can be put in table form and we can see that the range of plagioclases from anorthite to albite parallels the classification of igneous rocks in (1) percentage of silica, (2) temperature of formation, (3) amount of water necessary to form the more sodic varieties. If we know the type of rock, we can predict with considerable accuracy the variety of plagioclase that may be present as an original mineral.

Percentages and temperatures shown were taken from various sources and put in round numbers. These must be regarded as approximations only. This table is only intended to show trends.

The two end members of the group act quite differently under the usual metamorphic processes. Anorthite is acid soluble and is attacked by carbonic acid. Albite is not acid soluble. If intermediate plagioclases are attacked by carbonic acid, part of the anorthite may be dissolved out and the feldspar become more sodic. Sometimes at igneous contacts, if lime is available and CO_2 has been driven out, the usual process is reversed and the feldspar becomes more calcic. Many of the best specimens of plagioclases are derived from metamorphic processes.

A NEW HOBBY

By RUTH H. WENTWORTH
Portland, Me.

In 1940 I knew practically nothing of rocks and minerals. There were large pieces of white quartz and granite in my rock garden. In a box in the house was an amethyst crystal, a jasper from Nantucket Beach, and a piece of beryl that belonged to my grandmother. But, the fact that there are about 2000 minerals that could be found on this earth, was to be an utter surprise.

That Spring, we bought an old abandoned farm near Freeport, Maine, for a summer place. This kept us constantly busy, but not so much so that I could not see new things. While setting out a row of strawberries on an acre plot that my husband had just prepared for our vegetable garden, I discovered a beautiful red, tan and white striped rock about 22 inches around, smooth and waxy, and quite new and beautiful. I placed it at the end of the row for a marker and forgot about it completely.

Later we drove to a neighbor's house to insure our farm. While there, I asked the man and his wife about some beautiful rocks which were on a shelf. These came from their private mine which they kindly showed us. We returned to the farm bringing beautiful specimens of rose quartz, black tourmaline, mica and feldspar. This was the beginning of a new hobby.

Until 1944 I collected every different rock I could find and arranged at the farm. This was not enough. I had to know their names. So I went to the public library in Portland. I read and made notes on about a dozen books. Soon it became apparent that there are *Rocks and Minerals*. "Field Books of Common Rocks and Minerals" by F. B. Loomis informed me about rocks. "Getting Aquainted With Minerals" by English informed me about the characteristics of minerals but not until I had read some of "Textbook of Mineralogy" by Dana, fourth edition, did I begin to understand the classification of minerals. What minerals I have now are at home and are listed according to Dana's eight divisions of minerals.

Suddenly remembering the beautiful rock which I had left in the garden for a marker, I rescued it and cleaned it and recognized it as ribbon agate. It is now a book end for my mineral library. Perhaps another one will be plowed up to match it. I have found several jaspers, waterworn but excellent for polishing.

As a new member of the Maine Mineralogical & Geological Society, I am looking forward to field trips this summer. This new hobby is very instructive and exciting, as each new hunt brings something new and alluring to add to my growing mineral collection.

EAST TO WEST AFTER CUTTING MATERIAL

BY JEAN E. WELLS
Wayland, N. Y.

This trip was cooked up for two reasons. One was the fact that the gem material I had been buying just didn't seem to be what I wanted. The other reason was that I wanted to collect my own material as well as to cut it.

To begin with, I had no car and a very small amount of money but I did want to visit Idaho for my collecting trip. During the late war I was stationed at Boise, Idaho, and while there heard of good cutting material being found nearby but never had an opportunity to collect, in fact I had no idea where it could be found.

Before commencing my trip, I wrote to the Editor of *Rocks and Minerals* for names of subscribers around Boise and received several names and their addresses. I wrote to these collectors and heard from them all and all wrote that the best material was located in the desert and that a car was needed and plenty of water. They all invited me to visit them and would take me out on field trips. As it turned out, I visited only one, Mr. M. R. Emerson, of Caldwell, who took me out on five trips from which I obtained about 300 pounds of good material.

I started West via Greyhound Bus, on Aug. 2, 1946, and arrived in Boise Aug. 6th. I spent a day in Boise looking the town over and then went to Caldwell to Mr. Emerson's; he was preparing to go on a vacation to the mountains and invited me to go along. We spent several days on this trip and upon returning we immediately started on our field trips.

The first trip was to Buck Gulch in eastern Oregon. Here we visited a barite locality, which Mr. Emerson had discovered, where the mineral, as crystalline nodules, are found only after heavy rains or spring erosion. A short distance further on, is a petrified wood locality, where I collected some very beautiful agatized wood which ran in color from dark brown to flame red. I also found a very good gypsum crystal specimen.

The second trip was made to a place called Graveyard Point which is in both Idaho and Oregon, a locality noted for agate. Much of the material was jasper-agate in colors of red, green, brown, yellow and mixtures. I obtained, also, some very good specimens of plume agate, with white and yellow plumes. Common agate is found extensively in the area, some of which is mossy. This area is very large and a lot of good material is still to be picked up with untold tons buried under the surface.

Trip number 3 was to Nigger Rock, a black cinder cone butte in Oregon, a locality for petrified wood. We spent several hours roaming around the hills and found some small but beautiful specimens of agatized wood. After lunch we found a spot where someone had been digging. Of course we started looking around to find what they had been excavating for and picked up several tree limbs and other pieces of petrified wood which they must have missed. We started digging and got a good batch of limbs; these were coated with sandstone and must be cleaned off.

Trip number 4 was to the Signal Light locality, some 10 miles northwest of Weiser, Idaho, after geodes, agates, jasper, and agate nodules but as the field had been almost cleaned out we didn't do so well. What few things we did get were well worth the effort, however. We had to dig for them and worked up a good batch of blisters.

Trip number 5 was to Succor Creek, Oregon. As Mr. Emerson wanted to do some exploring, we made it an overnight trip, sleeping out on the desert. In the canyon itself we obtained some good thundereggs; most of them were filled with agate but some contain calcite crystals and some also turned out to be geodes. A short distance from the canyon we went fossil hunting and found impressions of leaves, cattails, and pine needles.

Note: all the above localities are either in eastern Oregon (N.E. Malheur County) close to the Idaho line, or in southeastern Idaho (N. W. Owyhee

County) close to the Oregon line (the Signal Light locality is in Washington County, Idaho).

If planning a trip of this type, into regions unknown to you and where people are few and far apart, I would suggest that you contact a collector or some other person who is familiar with localities. Probably you will find someone who will go with you and show you the locations. In many areas the material is being picked up very rapidly and quite a number of old locations are played out. It is best, therefore, to contact someone who knows the territory and it will save you a lot of time and money. I have found that people who are interested in minerals to be the best in the world and always willing to help.

The writer extends his most grateful thanks to Mr. Emerson and his family and to all others who made his trip a grand success.

VANADIUM*

The metallic element vanadium is grayish-white in appearance, non-magnetic, and has a high electrical resistivity It is one of the least volatile metals at the melting point; extremely difficult to reduce to the pure metallic state from its oxides. Though relatively rare, vanadium is found in a number of minerals. Of these, the principal sources are patronite, descloizite, cuprodescloizite, mottramite, vanadinite, carnotite, and rosecoelite. VANADINITE is a chlorovanadate of lead. Crystals are usually prismatic, often skeletal and resembling those of pyromorphite. Occurs also compact, fibrous, globular, and in crusts. Fracture is uneven to conchoidal; hardness, 3; specific gravity, 6.7 to 7.2; color, yellow, brown or red; streak, white to pale-yellow; luster resinous. It is translucent to opaque. It fuses easily and is readily soluble in nitric acid. It is an uncommon mineral usually found in altered lead deposits but never in large quantities. CARNOTITE is a vanadate of potassium and uranium, containing small amounts of radium. Crystals are small, tabular, and with rhombic outline; usually observed in scaly aggregates or as crystalline powder. Cleavage is perfect basal; fracture, earthy; hardness, 1 to 2, color, canary to lemon yellow; luster, resinous to dull. It is transparent to translucent. Occurs as a powdery incrustation in loosely cohering masses or as an impregnation in sand or sandstone. Common associates are malachite, azurite, biotite, and magnetite. ROSCOELITE, sometimes called vanadium mica, is essentially a muscovite in which vanadium has partly replaced the aluminum. It is found in minute scales; micaceous structure and cleavage. Color is clove-brown to greenish-brown; luster, pearly.

Vanadium is one of the most widely distributed of the elements, occurring in small percentages in granites, sedimentary rocks, and clays and also in many iron, lead and copper ores, bitumens and petroleums. In order of importance, sources of vanadium consumed in the United States are 1) PATRONITE ores from Minasragra Peru, formerly the world's chief supply of vanadium. The patronite has now all been mined and the present vanadium ore is largely a mixture of hydrous calcium vanadates and the hydrous sulfate. 2) Miscellaneous mixed ores, mainly from southwestern United States in which VANADINITE is the usual vanadium carrier. It is found associated with lead, zinc, and copper in numerous vein deposits in New Mexico and Arizona and in smaller deposits in Nevada, Montana, and California. 3) CARNOTITE from southwestern Colorado and adjoining parts of Utah. Associated with the mineral, which occurs in loosely cemented sandstones, are several other vanadium minerals. The deposits are mostly small and carry from 2 to 4 percent vanadium oxide. The ore is mined not only for its vanadium and uranium content but also for the small amount of radium it con-

(Continued on page 739)

* Abstract of a paper prepared by W. B. Winstou, to be published in vol. 43, no. 2, *California Journal of Mines and Geology*, in press.

THE AMATEUR LAPIDARY

A NEW INDUSTRY FOR ALBUQUERQUE, N. MEX.

WALTER B. GILBERT, 416 N. 4th ST., TO MANUFACTURE NEWLY DEVELOPED LAPIDARY EQUIPMENT.

Automatic machinery for shaping and polishing gem stones is now being processed and will be in production in the near future. Mr. Gilbert has obtained exclusive manufacturing rights on patents of L. A. Basinski, 309 N. Carlisle Ave., who has moved here from La Grange, Illinois, to take charge of sales and research. The products will be sold all over the country.

Lapidary has a great future, but it is in its infancy. Equipment in all lines of production, both farming and industry, has shown a large improvement and remarkable progress in labor saving methods and devices,—but lapidary? There has been some progress. The diamond saw, artificial abrasives, silicon carbide, norbide, electric power, are all potentials for lapidary, but with all these possibilities the methods applied to shaping, polishing and mounting a cabochon today are identical to those used hundreds of years ago.

Why haven't lapidary methods of production improved? In the first place, there are no large producers of lapidary equipment who can spend large amounts of money for research and development of new devices and methods. These developments and improvements have thus far come from individuals. And in the second place, lapidary has been held back as some sort of secret art to be enjoyed by the families and their descendants that were in the possession of this knowledge.

However, you can not hold back progress nor the desire to improve. In order to make the hobby more pleasant, a more modern method of production had to be developed. Nothing is modern today unless it is labor saving. After a couple years of research the first automatic polishing machine was produced. It would polish six cabochons of various sizes at one time. It is a real thrill to be able to polish six stones at a time, but to operate the polishing machine, the stones or blanks had to have some pre-shaping.

The shaping of blanks on an emery wheel was slow and the amount of blanks preformed on a wheel in a day would scarcely run the automatic polishing machine an hour. Another two years of research was required to develop a rock shaping machine. At last the combination was complete. Six pieces of sawed slabs could be run in the automatic shaper and then the six pieces in the automatic polisher to complete six beautiful cabochons that the most expert lapidary would be envious of.

Both machines were simple, inexpensive and easy to operate. After a couple thousand cabochons had been run, samples were taken to some of the manufacturing jewelers. They were very much impressed, but they were interested in standard sides for stamped mountings. Could the machines make standard sizes?

Yes, the machines could be made to produce standard sizes but it would mean additional cams, stops, and more expense. This would result in a machine that would be too expensive for the average individual to own. Then, too, cutting cabochons to a standard size would not always bring out the beauty of design in a stone. If a method could be developed to mount stones of various sizes and shapes, the entire process would be complete.

After more research, an unique method to mount a cabochon was found by a simple molding process, which consisted of using a white metal alloy and casting the stone in the metal with a quick chilling method so the heat of the metal would not affect the stone. The carved-like surface had an instant appeal to everyone who saw it. The design was

more or less accidental; no two were alike. Here was a mounting that was similar to the stone,—it was the work of nature itself.

When shown to one of the leading jewelers, his remarks were that the mounting certainly was beautiful, but the cost would probably be prohibitive. However, the cost is surprisingly inexpensive.

The mounting can be finished in any type of precious metal; platinum, gold, or silver for jewelry, or the less costly metals. This mounting has great possibilities for ornamental purposes, on paper weights, picture frames, ash trays, or pen bases, and also for transparencies for use in lamp bases where a light may be used.

Since all these developments will be made available soon by the Gem Mill Equipment Company, there is no reason why the lapidary industry should not grow.

VANADIUM

(Continued from page 737)

tains. There is no other mineral just like carnotite, and it is mainly confined to this country.

ROSCOELITE was formerly the chief domestic source of vanadium but the largest deposit, at Rifle, Colorado, is now exhausted. A vanadium-impregnated sandstone often erroneously called roscoelite occurs in Utah. DESCLOIZITE, CUPRODESCLOIZITE and MOTTRAMITE are found in commercial quantities in Rhodesia and southwest Africa. *In California* vanadinite has been found in Kern County, near Searles Lake; and with galena and mimetite, near Randsburg. In San Bernardino County, it occurs with cerussite and cuprodescloizite in the Vanadium King mine; and it was found near Moore Station on the U. P. Railroad. Roscoelite, interlaminated with gold, was found in El Dorado County near Coloma; and it was found in Big Red Ravine, near Sutters Mill.

Vanadinite may be concentrated on tables because of its high specific gravity. Carnotite has been concentrated by air blast during the crushing process. Roscoelite is too light to permit its separation by gravity concentration. Vanadium may be recovered from phosphates by a patented process. No important industrial uses of the pure metal have been developed. The principal use of vanadium is as an alloy in steels where great toughness and torsional strength are needed. Vanadium in steel lessens coarse crystallization and grain growth and influences the manner of solution or precipitation of the carbide in or from the solid solution, iron-rich matrix. Vanadium steels are readily cast, forged or rolled.

SELECTED REFERENCE—As vanadium is not commonly used like lead, zinc, iron, or copper, information is correspondingly less widespread. For more complete discussion the following references, some of which give extensive bibliographies, have been selected.

1. Am. Inst. Min. and Met. Eng.: *Metals Handbook*, Am. Soc. Met. *Trans. vol. 40*, (1910) pp. 274 to 299., Hewitt: "Vanadium Deposits in Peru." *Ore Deposits* of the Western States (Lindgren Vol.)—"Vanadium in Sedimentary Deposits."
2. Handbooks: *Taggart.* Handbook of Mineral Dressing. *Eshbach,* Handbook of Engineering Fundamentals. *Peels,* Ming. Eng. Handbook. All Wiley Handbook Series.
3. U. S. Bur. Mines: *Rept. Inv. 2873* (1928) 12 pp., Doerner—Radium, Vanadium, and Uranium from Carnotite. *Inf. Circ. 6572* (1932) Vanadium General. *Minerals Yearbook* Statistical and economic compilation published yearly; chapter on Vanadium each year.
4. U. S. Geol. Survey: *Bull. 530* (1913) Hess—Vanadium in New Mexico, Carnotite in Utah. *Bull. 750* (1925), Utah—Colorado Carnotite Region.

CLUB AND SOCIETY NOTES

Attention Secretaries—If you want your reports to appear in the October issue, they must reach us by September 20th—the Editor.

Mineralogical Society of Southern Nevada

One of the most interesting and impromptu programs held by the Mineralogical Society of Southern Nevada was a round table discussion in which the importance of minerals in our daily life was stressed. Mrs. E. L. Sapp, Boulder City, introduced the meeting with a discussion of the mineral Borax. She told of its location, processing and uses, supplementing her points with outstanding specimens of Colemanite. Mr. I. P. MacDonald followed with the presentation of the mineral Mica. The facts he presented not only made interesting listening but also brought out the importance of mica as insulation and uses in the wallpaper and paint industries. Mr. Jim Redding, President, rounded the program with an informative discussion of the stages of grinding, sanding and polishing of cabochons. This was made more interesting by his demonstration of the above steps using his portable equipment.

The Society also had as guest speaker at the June 4th instructive meeting, Mr. Harry Fuller, Geologist of Boulder City, who spoke on the subject, "The Fundamental Principles of Geology". Because of the all embracing nature of the subject his remarks were limited to the explanation of the Geologic Time Chart, and various geological theories including that of Isostacy. Mr. Edward T. Schenk, Geologist, also of Boulder City, was to have presented the companion program July 1st, on the topic of "The Geology of this Area", which included Lower Grand Canyon, Searchlight, Goodsprings to the Valley of Fire.

It was with regret that we learned Mr. Schenk would be unable to attend the meeting. Mr. Harry Fuller graciously saved the day, by not only reading, but also explaining the paper prepared by Mr. Schenk, much to the delight and appreciation of the members and friends. It is not only because of Mr. Fuller's intense personal interest in Geology but his knack of explaining the topic by drawing questions from the floor, that makes his program so interesting and enjoyable.

The June Field Trip to Petrified Hollow near Kanab, Utah, turned out to be a very unusual and successful trip. The elements tested the endurance of the Rock Hounds as the trip began in a sand storm, followed by rain, with its companions, Wind, and Cold. The rain could be considered beneficial as it brought out the color of the woods as nothing else could do. The unpleasant conditions were forgotten as members scrambled gathering their prey.

The July field trip will be to Mount Charleston, where we expect to get Trilobites, and other Fossils.

The Society wishes to extend an invitation to Members of all Societies to contact our group when traveling this Area. Listings of names and addresses of Members of our Society whom visitors may contact here, are posted with service stations and cafes in Southern Nevada. Should they desire more details they may be had by dropping a line to Box 23, Boulder City, Nevada.

FLORENCE McMILLON,
Sec.-Treas.

Chattanooga Rocks and Minerals Club

The June 24, 1947 meeting of the Club was held at the University of Chattanooga Geological Department, Chattanooga, Tenn. Mr. W. S. Tallman described his work as First Assistant to Gutzon Borglum in the carving of the gigantic heads of Washington, Jefferson, Lincoln, and Theodore Roosevelt in the granite cliffs of Mt. Rushmore in the Black Hills of South Dakota. Mr. Tallman brought with him many fossil and mineral specimens from that district.

Rockhounds visiting Chattanooga may call on Asst. Professor D. K. McGaw, of the Club, for information on local minerals. His business phone is 6-7363, residence 6-7812.

Geo. C. Olmsted, Pub. Chm.
Signal Mountain, Tenn.

Gem and Mineral Club of Douglas

On April 7, of this year, we organized our Gem and Mineral Club of Douglas with a membership of 28. Today we are 78 strong and have had some wonderful field trips on which we found fine agate, jasper, topaz, garnet, opalized wood. We are looking forward to an early trip into Mexico.

Ella White, Pres.,
451—9th St., Douglas, Ariz.

Akron Mineralogical Society

The Akron Mineralogical Society had a picnic and field trip on Sunday, July 13, 1947, at Flint Ridge Park, near Newark, Ohio. Preceding the trip, a business meeting and election of officers for 1947-48 was held.

Dr. Paul Acquarone, associate professor of biology and geology at Akron University, was re-elected president; B. M. Brehm, vice president; Mrs. Rhea Akins, secretary; Leland Kitchen, treasurer; and Mrs. C. R. Violette, publicity.

The next field trip will be held on Aug. 10, to Kelly Island, Ohio.

Mrs. C. R. Violette
392 Reed Ave., Akron 1, Ohio.

North Country Mineral Club

The June meeting of the North Country Mineralogical Club was held at the Plattsburgh Public Library on Thursday evening, June 26th. The speaker was Mr. Harold Benson, instructor in Chemistry at Champlain College. Mr. Benson's topic was "Mica". He highlighted his talk with samples of different types and colors of mica. Slides were shown, many of them using a polarizing lens to bring out full, rich colors. Out-of-town guests were present from Pittsburgh, Penn. and Minneapolis, Minn.

The Club suffered a serious loss in the death of our vice-president, Dr. Walter L. Taylor, principal of the Laboratory School of Plattsburgh State Teachers College. Dr. Taylor died May 30, 1947, as the result of an automobile accident. His interest and enthusiasm were responsible for bringing several of the younger members into our club. At the June meeting, Miss Jacquiline Hoff, of Plattsburgh, was elected to succeed him as vice-president.

On June 29th, we went on an all-day field trip, which included visits to three different localities. We stopped first at an esker, a few miles north of Plattsburgh, just east of the highway on Route 9. Deposited by a sub-glacial stream during the Ice Age, the ridge of gravelly and sandy drift has become clearly exposed by gravel-digging. One especially interesting feature was a distinctly-seen layer of shells about six inches deep, which scientists say are 25,000 to 75,000 years old.

Next we went to the Forrest A. Locklin farm, south of Chazy, near the present lake shore. After a picnic lunch there, we explored the main objective of our trip—a coral reef. This reef, which contains countless fossils, as well as specimens which show the cell structure of the coral itself, was built up at the period when this section had a sub-tropical climate, and a salt water sea known as Lake Iroquois covered the Champlain Valley, over a much larger territory than that submerged by Lake Champlain.

Later in the afternoon, most of the group visited a limestone quarry just outside of Chazy, N. Y. Specimens of quartz and calcite crystals, hematite, limonite, limestone, and sandstone were found here.

Another all-day field trip was held on Sunday, July 13th. At this time the destination was the abandoned Arnold Hill iron mine, 2½ miles northwest of Clintonville, N. Y. Out-of-town guests from California, and from Philips Manor and Rochester, N. Y., joined us.

Following a picnic lunch, Mrs. Marjorie Lansing Porter, Clinton County historian, who has done research on the history of iron mining in the Adirondacks, spoke. She told of the discovery of the Arnold Hill ore beds during the early period of search for minerals in this region, of its purchase as a "sheep pasture" by a man who realized the presence of rich iron deposits, and of the beginning of operations in 1809. She traced the development of the mine throughout the 19th century, when it supplied high grade ore for the forges of Clinton and Essex Counties, New York.

Mr. James Powers, of Clintonville, also spoke. Mr. Powers had worked in this mine as a boy. He later did diamond drilling in every state in the country, prospecting for minerals and oil for private companies and the United States government. He related facts about the history of the mine and discussed its operation during its last years of activity. Mr. Powers led the group on a tour of inspection of the old pits, the sites of the former tower, engine house, etc., and the ore dumps. Specimens were found of various typs of iron ore, including magnetite, the so-called "blue" and "grey" ores, feldspar, jasper, smoky quartz and rose quartz.

Regular meetings will be continued as usual during the summer, on the fourth Thursday evening of each month, in the lecture room of the Plattsburgh Public Library, Plattsburgh, N. Y. Rockhounds are always welcome, both at the meetings and on field trips.

Gertrude E. Cone, Sec.

Pacific Mineral Society, Inc. of Los Angeles, California

The Pacific Mineral Society, Inc., had a real treat on Friday, June 13th when Mrs. A. E. Allard gave us the History and Legends of Minerals, with Mr. Allard showing kodachrome illustrations. Starting with gold, which to most people is the most important as well as familiar mineral, she told of its mention in the second chapter of Genesis; of its discovery in California first in Placerita Canyon in 1845 by Francisco Lopez, and from this place the first gold was sent to the U. S. Mint. In 1848 it was found at Sutters Mill, which most people think was the first gold discovered in California. Next she discussed the copper minerals, stating that copper had been in use as early as 4000 B. C. and that the American Indians found and used it around Lake Superior. Following this were many other minerals, such as iron, discovered in 1000 B. C.; lead in 500 B. C.; zinc in 1730; aluminum in 1849, but not successfully developed until 1890.

This delightful historical review was followed by picture rocks (geodes), showing a crow, coon, horned toad, fox head, and many others.

After this came a unique showing of minerals in their natural colors which gradually changed over to their fluorescence by superimposing one picture over the other. Mr. Allard is one of the very few who has succssfully worked out the photography of fluorescence, and his ingenious way of projecting them, using two projectors, was most pleasing and instructive.

The monthly field trip will be at Winchester in Riverside County, on Sunday, June 22nd.

MRS. O. C. SMITH
Pub. Chairman.

The Los Angeles Lapidary Society

Mrs. Lillian Gaston, wife of President Jack Gaston, enlivened the August meeting of the Los Angeles Lapidary Society with tales of her recent three months trip to Norway. Rock hunting in Norway, according to Mrs. Gaston, may be done in a taxi. At least, she was able to obtain some feldspar and tourmaline that way. "Ole" S. P. Hansen and "Vigo" V. Gunderson were available to act as interpreters, but we found that Lillian still speaks English.

To complete a very interesting evening, Mr. Chas. Crosby, our program chairman, presented an educational motion picture produced by the Shell Oil Company concerning mineralogy and oil.

In order to promote a greater interest in amateur lapidary work and to bring together the lapidary societies in and around Los Angeles, the Los Angeles Lapidary Society is planning to hold their first Annual Picnic on Sunday, September 14th. All lapidary groups are invited to join us in this get-together for fun, fellowship and "rock lickin'". If interested, please communicate with our picnic chairman, Mr. Ted Bennett, 22 N. Hidalgo Avenue, Alhambra, California.

THE FACETEERS meeting this month was conducted by vice-chairman, Mr. Thomas Daniel, who held an Open Forum on the mechanics of faceting. This group is so actively interested in facet cutting that a meeting of this kind is very stimulating as much valuable data is presented. After considerable discussion, the best information is recorded for future reference. The display of good faceted stones exhibited at each of these meetings would be the envy of many commercial jewelers, as every month the group selects a new cut for the ensuing month. Since the selection of material is left to the individual, the results of these projects in topaz, tourmaline, smoky quartz, amethyst, synthetics, and many other kinds of gem stones are surprising and colorful.

Willella Gunderson,
Pub. Chairman

Southwest Mineralogists Take Field Trip

Packing their shovels and picks, Southwest Mineralogists travelled off to Horse Canyon, in Southern California, on June 14 and 15, 1947. Thirty five members enjoyed a barbecue at their camp. Mr. Albert Hake, president, returned with some rare specimens of agate, which were displayed with slides at the club's last meeting.

Mr. and Mrs. E. R. Hickey have invited the Southwest Society to their Mint Canyon home on July 4, 5, and 6. Rumor has it that they may find Gold in them thar hills in Placerita Canyon. Many minerals that have been found in and around Mint Canyon are to be relocated on this field trip.

MARIAN R. NOWAK
Corresponding Secretary,
Glendale, Calif.

New Club in Utah

Moab, Utah, center of the greatest scenic wonderland of North America, was the birthplace of a new Gem and Mineral Club, Thursday night, June 12, 1947. At this time the club was not named, but names will be submitted and voted on at the next meeting, which will be June 26. Thirteen prospective charter members were present, and from among them the following officers were elected.

Jess Abernathy, president, Howard Williams, vice president and Mrs. Wm. G. Harding, sec'y-treasurer.

Dr. Williams, 94 year old pioneer of this country, and famous through-out the western United States for his explorations of this vast area, and promotion of the Arches National Monument, was elected honarary president of the embryo club. We all feel that Dr. Williams and his vast knowledge of this beautiful country will be very helpful to us. Mr. Abernathy, well known gem cutter and mineralogist, and organizer of the club, will also serve as instructor.

During the course of the first meeting there were many lively discussions, which is indicative of a wide-awake group and much fun is promised, as well as the gain of useful knowledge.

Mrs. Wm. S. Harding
Moab, Utah.

Oklahoma Mineral and Gem Society

On Sunday, June 8th, 1947, the Oklahoma Mineral & Gem Society celebrated its first anniversary. The Oklahoma City members unrolled the "Welcome Mat" to the out-of-town and out-of-state members. The day was spent in viewing the many collections and in exchanging ideas and experiences, and in rockhound talk in general.

All members assembled at the H. T. Daniels residence and then made the rounds of the other club members' homes. A picnic lunch was served at the O. C. Bundy home and then more collections were viewed. Ice cream and cake were served at the J. B. Lankford home before the members departed for their homes in the evening.

Out-of-town members and guests were: Mrs. Perry and Mr. Osborne of Perry's Rock Shop, Poncha Springs, Colorado; Miss Blanche Harding, Mr. & Mrs. Herman Klingler, and Mrs. Jantz and son, Harry, all of Custer City, Oklahoma; Bill Swearingen of Blackwell, Oklahoma.

The Society was honored to have as their guest for the day Dr. Robert H. Dott, Director of the Oklahoma Geological Survey, Norman, Oklahoma.

The Oklahoma Mineral & Gem Society was organized on June 6, 1946, with seventeen Charter Members. It is now one year old and boasts forty-six members.

H. T. Daniels—Publicity Chairman

Rocks and Minerals Club of Woodstock, Vt.

On June 28, 1947, the members of the Rocks and Minerals Club of Woodstock, Vt., went on the second field trip of the season. This was to the Fox gold mine, on Buffalo Brook, in Plymouth, Vt. (Plymouth is in western Windsor County in the southeastern part of the state). We spent a pleasurable and instructive day descending two abandoned shafts in search of specimens and doing some amateur gold panning in the stream.

At our 7th regular meeting, the program was supplemented by a treatise on minerals and gold mining in particular in the Plymouth area.

Ronald W. Gallup,
Club Advisor,
Woodstock, Vt.

THE CRITICS

BY ANTHONY THURSTON
Box 104, Swansea, Mass.

These words are written especially for the benefit of collectors and students of minerals or fossils, for it is only you who can find satisfaction in my complaints.

We have all experienced the doubt in the voices of our friends when we tell them a lump of agatized wood was once a living tree, and seen the strange way they look at us when we say that the faces of quartz crystal are not artificially cut. But I think now I have suffered from every dumb question and statement that the public can ask of the collector. I have often been tempted to hang a black curtain over the show cases, baring them to fellow rockhounds only, but it has now become a matter of interest as to whether or not I have heard the latest. For instance, a few days ago there was a new one, and I had a hard time to keep from laughing. A friend while visiting was leisurely looking over a case in which I have carefully aranged minerals in chemical groups. She stared long at a piece of calcite and I hoped she would ask something about its cleavage, so that I might have a chance to impress her with facts and figures. But no! Suddenly she turned and said "Mr. Thurston, do stones grow?" With a straight face I simply said, "no," realizing she was not thinking of a beautiful crystal growing in a geode. "But," she exclaimed, "in our garden there are all sizes, big ones and little ones!" Then I left to gather strength for an answer.

Then there was the fellow who looked carefully at a perfect little staurolite and said, "somebody made that!" I got out my Dana's Manual, looked up staurolite and explained that it was a twin crystal. What was his answer? He still said he didn't believe it. What gets me is the innocent way in which some questions are asked. Some look at a piece of muscovite and remark that it looks like the isinglass in their old stove. Another thinks that galena looks like the crystal of a little crystal radio. All without a thought that they might be the same.

Others look with slightly anxious eyes at my piece of uraninite and gummite when I say that this had a part in the atomic bomb. Sometimes they ask how we dare keep it in the house, more often they want to know how the bomb was made from it. Now I have a standard reply for this, I simply say, "A lot of foreign countries would like to know that too!"

We've all met the sort of person who doesn't believe our collection has anything at all unusual in it. I get some of these, too. One lady on being shown an Oregon Thunder egg, said the stream beside her Cape Cod home was filled with them, and why did I have to send to Oregon for it. Another was shown an Indian ax and was sure she had seen several in her flower garden and I could have them if I would come after them.

I usually follow up these stories, strange as they may be, on the slim chance that there might be a grain of truth behind the imagination out of which they grow. Then, too, I feel that as a student it is my duty to correct any false impressions. Usually I find lack of knowledge is behind the fanciful stories, and if I can leave someone with a clearer impression of what he has seen, I feel the trip was worth while. I remember the fellow who claimed there was a dinosaur track on his

(Continued on page 745)

WITH OUR DEALERS

The Streamliner trim saw is an important piece of equipment for your lapidary shop. It is manufactured by Hyatt Lapidary Equipment Co., of San Diego, Calif.

Gem cabochons, ovals for discriminating collectors, is a feature of W. J. Kane Lapidary, of San Francisco, Calif.

Karl Hudson, owner of the Hermosa Gem & Mineral Shop, Durango, Colo., has in stock a large number of local minerals. Get his list on them.

A new advertiser is Geo. C. Curtis, of Hermosa Beach, Calif., who can supply beautiful New Mexico agates.

Jade—any kind—any price—any quality—any time—can be obtained from Allan Branham, of Lander, Wyo.

Frank Duncan and Daughter, of Terlingua, Texas, have in stock some attractive Texas calcite. Order a few of them.

For diamond saw blades and other lapidary material contact S-T Gem and Mineral Shop, of Tujunga, Calif.

Hans Anderson, of St. George, Utah, offers guide service for Utah, Nevada, and Arizona.

Fred Roberts Jr., of Monterey Park, Calif., can simplify your display problem. Contact him for more information.

Another new advertiser is Plummer's, of San Diego, Calif., who can furnish attractive slab material and other items.

Mrs. B. F. Nonneman, of Salinas, Calif., can furnish minerals and gem materials which possess quality, color, and beauty.

Another new advertiser is Gem Mill Equipment Co., of Albuquerque, N. Mex., who announce big developments in lapidary. See their ad.

Still another new advertiser is Rocky Mountain Jade Shop, of Lander, Wyo. They are experienced cutters of jade and can supply hearts, crosses, pins, earrings, etc. set with their beautiful gem.

And still another new advertiser is the Akron Lapidary Co., of Akron, Ohio, who can supply diamond saws and other lapidary equipment.

Earl & Clyde Olmsted, of St. George, Utah, have a good policy on mail orders. Read it.

Schortmann's Minerals, of Easthampton, Mass., announce the aquisition of a large and very fine lot of phantom quartz xls from Brazil. Rush your order as the supply will not last long.

Grieger's, of Pasadena, Calif., announce that their new 15th Anniversary Catalog will be off the press Aug. 1, 1947.

Gorham's Gem Shop, of Bullhead City, Ariz., is featuring more slabs from a large stock.

Stewart W. Hurlbut, of Butte, Mont., has some rare species and many fine xls of Butte Minerals. Write him your needs.

A new advertiser is Highland Park Lapidary Supply Co., of So. Pasadena, Calif., who are manufacturers of lapidary machines.

And another new advertiser is Activator, of New York City, who has a wide range and strong fluorescent lamps for sale.

Mesa Lapidary, of Costa Mesa, Calif., wants to exchange polished limb sections of petrified wood for U.S. Commemorative stamps.

King Gems, Inc., of Colorado Springs, Colo., release the analysis of their King Jade, a new gem mineral which is being very favorably received by all cutters who have acquired specimens.

John L. and Etta A. James, of Tonopah, Nev., specialize in Nevada minerals.

A new advertiser is Mastercraft, of Long Beach, Calif., who can supply a number of special items. Better look up the ad.

Minerals for the collector—a few of the items in a large stock—are offered by Ward's of Rochester, N. Y.

Another new advertiser is Comparator, of N. Hollywood, Calif., who has an interesting introductory offer.

More fine minerals from an old collection are listed in the 15th release of Hugh A. Ford of New York City.

INTRODUCTORY OFFER

One section of fine Gem Stock Picture Wood—$5.00.
Free with each order.

One section of multicolored picture Agate.

NO TAX — NO POSTAGE

TEX'S GEMS AND CRYSTALS

BOX 414 **MILES, TEXAS**

PRECIOUS STONES & MINERALS

CUT STONES, CABOCHON & FACETTING MATERIAL

SEND FOR LISTS

W. FRANK INGRAM

ZETELLA ROAD **GRIFFIN, GEORGIA**

THE CRITIC

(Continued from page 743)

farm. I was sure he was mistaken for he lives some 50 miles from the Triassic sandstones of the Connecticut Valley, but one Sunday I drove out to have a look. There was the stone, all right, but his dino tracks were only the places where some hard round pebbles had weathered out of a mass of conglomerate from the Pennsylvania rocks. I carefully explained that this rock belonged to the coal age and since it was already solid rock, and probably deeply buried by the time the dinosaurs appeared, it could not be a track. This was evidently a let down to him, but I'm sure that he was convinced.

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